

MachHome

june 1999 • www.machome.com

Solutions for Work, Play & Education

Pump up the Volume

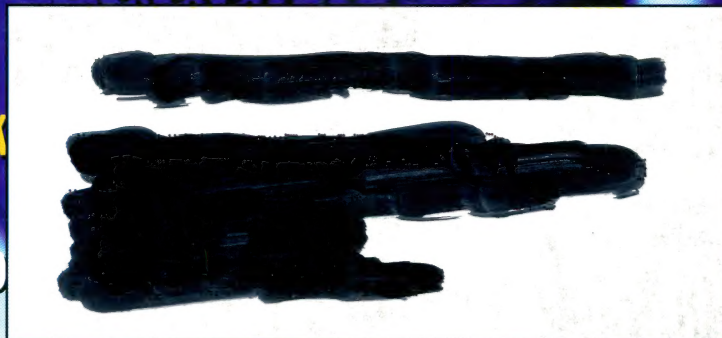
Cool Speakers
For Your Mac

Setting Up A Home Music Studio

Pocket Productivity: The Palm Office

Don't Miss New Owners, Tips & Tricks

Epson or HP: The Best Printer for You



U.S. MARINE CORPS TARGET

U.S. MARINE CORPS 25-METER ZEROING PROCEDURES

19:42 You learn the hard way in the outer sector... Like never get into a drinking match with a three-headed Bvkan. Never assume a Strogg is dead even when he's nothing but bloody scraps of straphel. And never go to bed with a Rabaul no matter how many breasts she has.



19:11

THE LINE BETWEEN MAN AND MACHINE SHOULD NEVER HAVE BEEN ERASED.

Blood vessels and wires should never have been crossed. Souls and circuitry, brain stems and processors.

QUAKE II™ © 1997 id Software, Inc. All Rights Reserved. Distributed by Activision, Inc. under license. QUAKE™ and the "id" logo are registered trademarks of id Software, Inc. QUAKE II™, the id Software name, and the "Q" logo are trademarks of id Software, Inc. Activision™ is a registered trademark of Activision, Inc. Mac version developed by Logiware, Inc. Logiware is a trademark of Logiware, Inc. Macintosh is a registered trademark of Apple Computer, Inc. All other trademarks and trade names are the properties of their respective owners.

"Action Game of the Year"
— PC Gamer & CGW

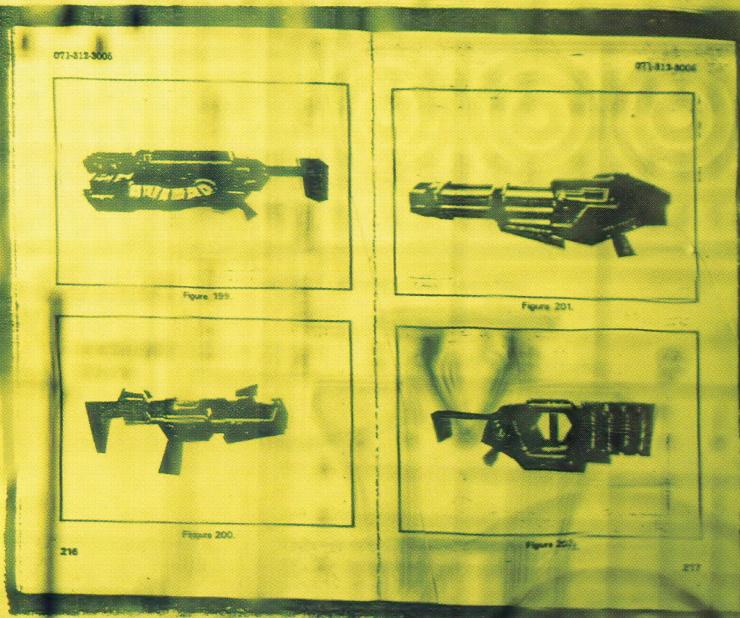
Logiware

id

Mac

ACTIVISION

www.activision.com



www.idsoftware.com

LINE NO.	EVALUATION	
1	Large, complex missions	What you do in one level could affect another. One false move and you could alert security, flood a passageway, or worse.
2	Superior artificial intelligence	The enemy is far from stupid. They will evade attacks, maneuver into strategic attack locations, and hunt your ass down.
3	Intense environments	Man gun turrets. Blow up subways. Smash glass. Toss grenades with perfect control. Duck to evade hits. Give them Hell.

18:03 Grottesque images of Straggs have
 been filling my sleep at night. Their
 metallic spines jutting awkwardly through
 muscle, skin and connective tissue, masks
 of human facial skin smeared and bonded to
 their cyber-alloy heads, crude but powerful
 weapons jammed into oozing, gaping sockets.
 Thank God for endless sleep ahead
 is dreamless.

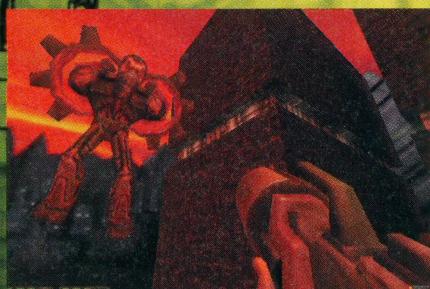
17:05 It's either us or them this time. We lose, and we all end up breasting on the grill of some wretchedly
 mechanized creature. We win, and the town of Calixto of Mars can start rebuilding the cities on Mars,
 Olympus, even Earth. Who knows - this might even get the old interspace team football league going
 again. (God, I miss Monday Night Football.)

"...there's simply
 nothing on this planet that
 can touch Quake II."

IV - 39

PC Gamer

U A K E II™





Hop on an iMac™ and in just ten minutes you could be surfing the internet and e-mailing everyone



The thrill of surfing.
The agony of choosing a color.



and their brother. Now for the hard part: what color will it be? www.apple.com  Think different.™

contents

june 1999 [www.machome.com]

volume 7, number 6

The Music Issue

Setting up a Home Music Studio _____ 14

By David Battino

With just a few pieces of hardware and software, you can compose, record, and edit music on almost any Mac — even if you aren't a skilled player. Here's a step-by-step overview of what your Mac is capable of right out of the box, and what you need to make your basement into a low-cost home recording studio. The hills are alive with the sound of Macs

The Mac Maestro's Toolkit

Music Software and Hardware for All Occasions _____ 20

By John Poultney

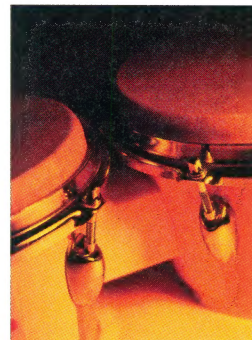
Don't let anyone tell you there's "no good Mac software." It's just not true, especially when it comes to music. Here's a list with something for everyone. And let's not forget hardware. Whether you have a plain-vanilla or USB setup, we see music in your future.

Speak to Me

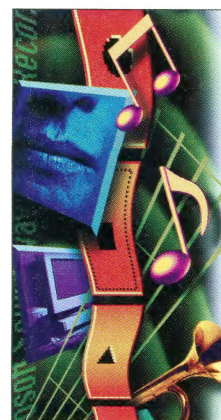
Cool Computer Speakers Reviewed _____ 24

By Anne Marie Feld

Does your computer play warm, melodious tones, or tinny, muffled scratching that might be mistaken for music in some parts? We review 12 speaker sets for your Mac to find out which ones give you that thundering bass, mellow mid-tones, and tremendous treble.



14



20

NewsWire

Read all about it: news, products, rumors, gossip, quotes, and innuendo

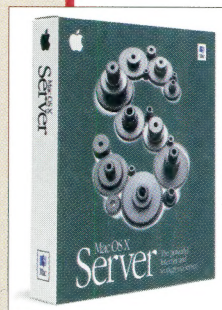
Apple gets open-minded with OS X Server

Bryce 4 spreads its wings

Epson's 740 gets a little color

Agfa's newest digital camera

Copyright software for geniuses



APPLE'S MAC OS X SERVER

10

Departments

28 Your Office

28 The Palmtop Office

Handheld computers keep you connected

32 Reviews

Face-Off: HP 882C vs.

Epson Stylus Color 750 printers

CloseUp: Lime-Green iMac 266MHz

42 Connections

42 Music on the Web

Tune into an embarrassment of riches

45 Bookmarks

Discover new music and learn ancient instruments

46 Your Family

46 Now go inside and play!

Get active — sports style

48 News and Reviews

The latest in kids' software

52 Entertainment

52 Beyond the Valley of the Dolls

TNT's new movie *Pirates of Silicon Valley* gets personal on Steve Jobs and Bill Gates

56 News and Reviews

Games, trains, and avatars

60 Back to Basics

60 New Owners

Understanding viruses

62 Tips & Tricks

QuickTime movies, virtual memory

64 You Ask, We Answer

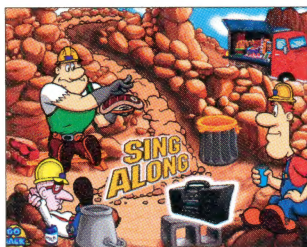
More PC files on Macs, and now was the time

66 The Way It Works

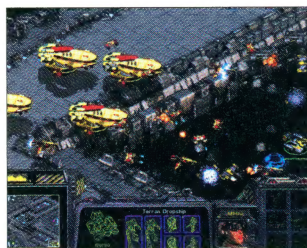
Compression technologies



32 Your Office Reviews



50 Your Family Reviews



54 Entertainment News and Reviews

Columns

6 From the Chief

Old Mac paddywack, get your dog an old SE/30

8 Write On

WOOF! The dreaded Giant Schnauzer

67 Ad Index

68 Smart Shopper

Your source for best Mac buys!

80 The Finder

PC stuff that oughta be on the Mac

Reviewed This Issue

Your Office: Software

- ★★★★ Action GoMac
- ★★★★★ DreamWeaver 2
- ★★★★★ PhoneWatcher
- ★★★★★ Reunion 6
- ★★★★ Territory Manager 3.0

Your Office: Hardware

- ★★★★★ DeskJet 882C
- ★★★★ HL-1050 Laser Printer
- ★★★★★ iMac 266MHz
- ★★★★★ Keyspan USB-to-Serial Adapter
- ★★★★ PowerPrint USB
- ★★★★ Roland Super MPU64 MIDI Interface
- ★★★★ Stylus Photo 750
- ★★★★ USB Floppy Drive

Entertainment

- ★★★★★ Gridz 1.2
- ★★★★ Imperialism II
- ★★★★ Jazz Jackrabbit 2
- ★★★★ Nethergate
- ★★★★★ Starcraft

Your Family

- ★★★★ Big Action Construction
- ★★★★ JumpStart Music
- ★★★★ JumpStart Adventures 6th Grade
- ★★★★★ Putt-Putt Enters the Race
- ★★★★★ Spy Fox in Cheese Chase

Our Rating System

- ★★★★★ **Mac-nificent.** You gotta get it. No flaws.
- ★★★★ **Excellent.** Recommended even if it has a minor flaw or two.
- ★★★ **Average.** Despite problems, still a worthwhile product.
- ★★ **Below Average.** Has serious flaws that limit its usefulness or fun.
- ★ **Poor.** Avoid this product at all costs.



Indicates iMac/G3 compatibility



Old Mac Paddywack

Recently I complained about computers not being fast enough. Today, however, I've been reintroduced to the simple, honest beauty that an old Macintosh can provide. I got myself a thrift-store Mac.

In one of his better scores, *MacHome's* intrepid news editor, Mr. Poultney, found an old SE/30 for \$15. For some reason, he decided he had enough computers lying around and

offered it to me. I jumped on it like a daschund at a duck-calling contest. That's \$15 for a machine that cost close to \$5,000 when it was new.

Check the standard specs on this beige bomber: 68030 processor screaming along at 16MHz, 4MB of 120-nanosecond RAM, 40MB SCSI hard drive, a 9-inch black-and-white monitor, Mac OS 6.03, and a 1.44MB floppy drive. Perhaps this was the machine that drove Steve Jobs to loathe floppies.

By the time it landed in my lap, though, someone had pumped up the lil' SE with a 230MB hard drive, more RAM, and an Ethernet card. Hey, anybody out there know this machine? Don't bother trying to get it back; it's found a new home.

So now the Antique SE (that's its name) is networked with a younger, far more powerful Macintosh, but it's teaching junior some lessons. The Antique SE takes about 45 seconds to boot; the younger Mac takes about three minutes. And on the SE I can usually find a file myself, without using the Find File application.

I'm jazzed that a 10-year-old computer can still work, let alone be networked and run programs. It's probably been beat to hell for a decade, used by countless people who slapped it, pounded on it, cursed it, and thrashed its operating system, but it still putt-putts along. It's cute, too.

Now I'm on the lookout for other old Macs. The CompuTown store across the street has a PowerBook Duo 230 for \$150. The Duo 230 was Apple's attempt at a sub-notebook — no floppy, no CD-ROM drive, and really, not much else, but it can slide into a nifty docking station to which you can attach most of those components. A thrift store I visited a couple days ago has the dock, for a mere \$25.

I'm not looking for power; I'm looking for nostalgia. Sitting at my desk listening to sad, slow songs on the stereo, I scrolled through the sad, slow specs for the old SE/30 and remembered working on one a few years back, trying to use QuarkXPress, run HyperCard stacks, and flog Microsoft Word 4.1. Was it really so bad? Yes, but one look at the Antique SE makes me feel like I'm scolding a puppy.

So, I've regained some perspective with regard to computing power. One day, many of us may feel the same way about the iMac: Boy, is it cute. Boy, is it slow. Boy, do I want one — especially if I can pick one up for \$15.

I might call my experience a religious one. For that, the SE has plenty of horsepower.

Alan Stafford

Alan Stafford
Editor in chief

President

James Capparell, jcap@machome.com

Publisher

Susan Ford, susan@machome.com

Editor in Chief

Alan Stafford, alan@machome.com

Art Director

Joy Jacob Sheldon, joy@machome.com

Editorial

Managing Editor Anne Marie Feld, anne@machome.com

News Editor John Poultney, john@machome.com

Reviews Editor David Weiss, dw@machome.com

Copy Editor Roberta McNair, roberta@machome.com

Editor at Large Chris McVeigh, chris@machome.com

CD-ROM Editor Chris McVeigh, chris@machome.com

Contributing Writers Susan Ashworth,

Jeff Battersby, Paul Boone, Art Jones, John Lee,

Cathy Lu, Amy Shafron, Carrie Shepherd

Circulation

Director of Circulation

J. Hugues Boisset, boisset@machome.com

Newsstand Consultant Angelo Gandino

Advertising

Regional Manager

Steve McMahan, steve@machome.com

415-957-1911, ext. 18

Smart Shopper

National Sales Manager

David Hughes, david@machome.com

415-957-1911, ext. 38

Operations

Business Manager

Lorene Kaatz, lorene@machome.com

Network Administrator

Ashley Jones, ashley@machome.com

Office Administrator

Joey French, joey@machome.com

MacHome Interactive

www.machome.com

Hot Tips Editor

Jeff Battersby, jeff@machome.com

Sales & Marketing

Susan Ford, susan@machome.com

MacHome Tech Support

(www.machome.com/techsupport.html)

Scott William and No Wonder

MacHome Software Center

Joel Mueller

Reprints

For 100 or more high-quality article reprints, please contact Reprint Management Services at 717-560-2001

Customer Service

For change of address, subscription inquiries, back issues, and service problems, call 800-800-6542 Monday to Friday, 7:30 A.M. to 10:30 P.M. central time; or write to MACHOME JOURNAL Subscriptions, P.O. Box 469, Mt. Morris, IL 61054; or e-mail us at mhjr@mf.kable.com. Basic subscription rates: One year (12 issues plus 6 CD-ROMs) U.S., \$34.95; Canada, \$44.95; foreign, \$54.95 (U.S. funds only). MACHOME JOURNAL may rent its mailing list.

General Offices

703 Market Street, Suite 535, San Francisco, CA 94103

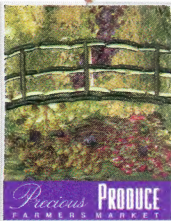
Telephone: 415-957-1911; Internet: www.machome.com

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. MACHOME JOURNAL is not responsible for unsolicited manuscripts. Submissions must be sent electronically for consideration. MACHOME JOURNAL is an independent periodical not affiliated with Apple Computer, Inc. "MACHOME JOURNAL" and "Solutions for Work, Play & Education" are trademarks of MacHome Journal. Copyright © 1999 by MacHome JOURNAL. All rights reserved.

YOU'VE GOT TO SEE IT IN

EPSON

COLOR.



Our 1440 dpi clearly lets you see this poster is made from fresh vegetables. And the farmer's market that sells them was just as particular selecting their printer. Sure, other printers might show heads of lettuce. But with an Epson® printer, they'd see every leaf of Radicchio, Bibb and Boston. And so would their customers.

PRESENTING THE WORLD'S FIRST 1440 DPI INK JET PRINTERS.

Only EPSON Stylus® Color printers have the PerfectPicture™ Imaging System for:
1440 x 720 dpi • Micro Piezo™ technology for a more accurate droplet • Quick-drying inks • Color photos up to 2x faster than other printers at comparable dpi.
With the Stylus 740 you get a 6 picoliter droplet, plus PC/Mac/USB compatibility.
For more info, call 1-800-GO-EPSON (ask for Oper. 3300) or visit www.epson.com.



Epson Stylus Color 640. Best for home & office. \$179

Epson Stylus Color 740. Best for business. \$249

The National Software Testing Laboratory, Inc. (NSTL) found that when printing a color photo on coated paper in 720 fine mode, the EPSON Stylus Color 640 and 740 print up to twice as fast as other printers. The NSTL report is available by calling 1-800-GO-EPSON. NSTL testing uses typical software applications and conditions. Actual results may vary according to applications, print settings and computer configuration. Prices may vary. Epson and EPSON Stylus are registered trademarks of Seiko Epson Corp. PerfectPicture and Micro Piezo are trademarks of Epson America, Inc. ©1999 Epson America, Inc.

Write On [Your Letters]

The Dreaded Giant Schnauzer

I was quite surprised when I came upon the article, "Rescue Me" ["Connections," April 1999]. Being active in the dog-show world and also being a trainer and dog owner, I thought the article was very informative and provided a great source of info for someone looking to add a pet to their family.

I do have to take exception to one fact: All the breeds you listed were done so without the use of any adjectives — all but the "dreaded" Giant Schnauzer! Living among four of the breed, I would have to say the correct description is loyal, intelligent, courageous, and devoted. So, either you are unfamiliar with the breed or you jest! Maybe a clarification is in order, because we would not want the public to be misinformed.

Karen Mancini

The dreaded Giant Schnauzer towers above the city, smashing buildings and flattening buses as screaming citizens scurry through the streets like ants. The marauding canine, which escaped from a secret government laboratory, is immune to all efforts to stop it — even the Army is powerless. The general in charge declares a state of emergency. Reporter Skip Emmitt screams into the TV camera: "The soldiers have failed to stop the Giant Schnauzer! He is now approaching the power plant!"

Hmmmm. The power plant, eh? If we use the power plant to send a giant bolt of electricity through him, we might be able to save Manhattan ... OK, we jest.

Disney's Buggin' Me

I'm sure all the parents out there know that most Disney software is available for the Mac, usually on a hybrid CD-ROM. The one glaring exception is the Pixar "A Bug's Life" CD-ROM. At the request of my four-year-old, after finding only a Windows version at Staples (not an overly Mac-friendly environment), I tried to get the Mac Version from the

Disney Website, and, you guessed it — Windows only. I got a lame e-mail back from Disney Interactive saying that while there had been numerous requests (duh), there were no plans to release a Mac version.

Frank J. Palazzi

Oh, Donna

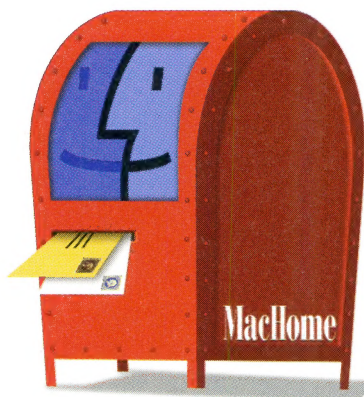
I greatly appreciated "The New Donna Rice" article in the March 1999 *MacHome*. Whatever her past may be, Donna is to be commended for taking a stand against pornography and for working to protect children from it. The bright promise of the Internet as a tremendous educational tool for our children is being greatly dimmed, in my opinion, by the ready availability of porn and the menace of pedophiles lurking on the Internet. Keep fighting to protect our children, Donna.

Sid Watson

To Donna Rice: Regarding part of your answer, "I would say that there's a lot of evidence of the harm caused by porn, and anyone who's willfully exploiting that just for financial gain should take a good look at themselves in the mirror."

I am offended by your irrational and primitive comment about adult Webmasters. Instead of concentrating on children's so-called "dangers on the Net," I think you need to focus more on parents' teaching their children morals that they can follow online and off-line.

I do agree that more work needs to be done to prevent online pedophiles from finding children online. Parents should be more educated about these dangers, but I feel strongly that online porn in itself (non-child porn) is definitely not harmful to minors or adults and should never be restricted. The First Amendment



should not be ripped apart just because someone under eighteen years old sees a little sex or nudity on their computer screen.

Steve Scofield

That's Just Stupid

Though I do not have the guts to try computer tricks on other people, I certainly have thought about it. John Poultny's April column [The Finder] made me laugh just as much. Even if one can't condone "revenge," it sure is fun thinking about it. If only I was sure I could fix any problems I caused!

J. L. Weiner

I suppose you find John Poultny's commentary hilarious and wish to encourage all of your readers to undertake such reprehensible behavior. Perhaps you should go back to the book as it was, for I'm afraid you have lost my subscription support.

D. Spector

Watch it, Mr. Spector, or we'll sick a dreaded Giant Schnauzer on you.

The Betting Line

Why did you run an article about online casinos ("Wanna Bet," March 1999) that listed Windows-only sites? None of the online sites Mr. Adams mentioned are accessible to Mac users.

You might want to refer your readers to this page, which has Mac users in mind: <http://casino-finder.com/mac.htm>.

Jennifer Hull

I wasn't aware of the site the reader mentioned, though it sounds like it's a good one. All the casinos in the article listed under the heading "Casinos Requiring No Downloads" are Mac-friendly.

The casino operators under the heading "Downloadable Online Casinos" all had

told me that they would have Mac software available "early this year," which is why I included them. That's why I also included the section on "Online Gambling Directories" — so readers could find other Mac-friendly casinos. Two of the Mac-friendly sites I mentioned, Starluck.com and TradeWindscasino.com, now are out of business — a good indicator of the fickle nature of this business.

Eric Adams

CISC vs. RISC

I recently got my first look at *MacHome* and I must say, I'm impressed. You have a very attractive, interesting magazine. As a longtime Macintosh professional though, something in the March issue ("What's 68K, Again?") caught my eye.

The author says a CISC chip, such as the 68K, uses a series of instructions ("... grab the garage door opener, point it at the door, and then press the button ...") whereas a RISC chip combines those into a single instruction ("open the garage door").

This is, of course, completely backwards. The idea behind RISC is to have a relatively simple instruction set where all, or nearly all, of the instructions can be executed in a single clock cycle. The 68K chip has instructions that can grab a number from memory, use it as an index to get another value, do some math on it, and put it in a register in a single instruction, but that instruction may take 20 or 30 clock cycles to complete. By comparison, a PowerPC chip may need five or six instructions to do the same job, but it can do each of those in just one clock, so it is much faster even at the same clock speed.

Michael Gibbs

Kudos to you, sir, and the others who wrote in regarding this misinterpretation. This is rather like stalactites and stalagmites — which hang up and which hang down? But I'll cop to some guilt vis a vis confusion over the number of instructions versus number of processor cycles (I've got personal problems, OK? Don't punish me). RISC accomplishes the same tasks as CISC in fewer clock cycles, not necessarily in fewer numbers of instructions. More work, less processing.

Ben Mickaelian, a software engineer at Newer Technology, explains that RISC is faster in part because the instructions are the same length, whereas CISC instruction lengths vary. With CISC, a processor might be able to retrieve some but not all of an instruction in a clock cycle, and would therefore take more clock cycles to complete that instruction than would be required in a RISC design.

John Poultney

Correction

In the March 1999 issue, we misattributed an image. Laurie Luczak drew the illustration on page 56.

write us!

Please write us with your comments! All letters are assumed intended for publication and may be edited. You can reach our Internet address through any e-mail service, including America Online and CompuServe. Our address is: letters @ machome.com

Master

The Macintosh & The Internet for the Macintosh

From SES Computer Training
With Earl Nightingale Jr.



Tape 1: Master The Macintosh

- Perfect for beginner users
- Includes System 7 thru 8.5
- Fun self-paced instructions

Tape 2: Master The Internet for the Macintosh

- Beginner's and advanced topics
- Learn how to customize your internet software
- Covers Sherlock internet features

The most powerful Macintosh learning tool ever. ON VIDEO!

ORDER NOW!

1 800 727-3055

each \$29.95 + S&H (\$40 for both tapes)

- Florida Residents Add Applicable Sales Tax.

- 30-day money back guarantee.



www.masterthemacintosh.com

Introducing the amazing VST FireWire® Hard Drive

Simply amazing. They're designed for those who want the most convenient, lightweight, small and durable hard drives on the market. In fact, the drives are so small they fit easily into a purse, briefcase, or even your pocket. And with data transfer rates up to 400 Mbps and the ability to hot-plug, these drives have it all -- speed, performance, portability and good looks. Just plug one into any FireWire enabled PC or Power Macintosh® G3 and you are ready to work or play. Currently available in 2GB, 4GB and 6GB capacities, these hard drives can easily be linked together in a chain with no device ID's or termination. Amazing? We think so. Visit our website for more information.



1394 FireWire port

Optional Kensington lock

Optional power input

1394 FireWire port

www.vsttech.com

125 Nagog Park, Acton, MA 01720 (978) 263-9700

Macintosh is a registered trademark of Apple Computer, Inc.

Apple Gets Open Minded OS X Server, Linux Rumblings Spell Progress

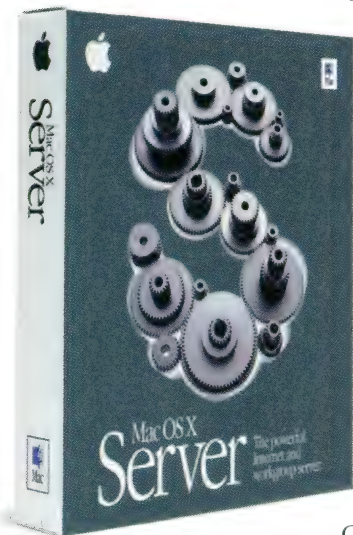
At yet another feel-good press conference at Apple's Cupertino headquarters in mid-March, head honcho Steve Jobs announced the release of **OS X Server**, the Unix/Apache-based server software with a Mac-esque interface. Jobs announced a lower price for the product as well — \$499, compared to the originally planned price of \$999, and showed off its impressive capabilities in such areas as speed, NetBoot, and potential number of connected users. Apple said a Mac running OS X server can support 740 connections per second, compared to 600 for the next highest performer, a Dell Pentium-based system running Linux. At this connection rate, Jobs said, the Mac's performance equaled 64 million hits per day.

All of which is well and good, especially for people that operate commercial Websites (and you know who you are) — many of the largest sites, including Apple's, use Unix-based systems operating with the Apache HTTP server. OS X Server simplifies the operation of this potentially unwieldy configuration, thanks to a graphical interface and other Apple improvements. This development is actually bigger news in the Unix world than in the Mac sphere. OS X Server doesn't run Mac software — we'll have to wait for the regular OS X release, expected later this year, for that — but the

G3-only Mac OS X Server is a potent tool for Webmasters, potentially expanding the market for Apple. In fact, Jobs also announced a high-end blue G3/OS X Server bundle for \$5,000. "Our goal is to have users take the computer out of the box," he said, "and have an incredibly powerful Website running in 15 minutes." Phil Schiller, Apple's VP of Worldwide Product Development, showed how that's possible, setting up a site from scratch.

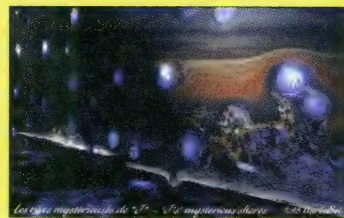
Open Up

But more eyebrows were raised as a result of a nonproduct announcement. Attendees at the event were abuzz with a rumor that Apple would be announcing a migration into the open-sourcing movement, where a product's source code is made publicly available (more on this trend in a moment). And shazam! — that's exactly what Steve announced. Several key portions of Mac OS X Server were "opened" on that fateful day, including the Mach 2.5 Unix kernel (on which the upcoming Mac OS X will be based), the Apache



Bryce Yourself

The original Count Dracula boasted to close friends and acquaintances that he could control the wind and the waves. We gotta ask, who wouldn't like that sort of power? Well, MetaCreations can give you some



of that capability with **Bryce 4**, the latest version of its terrain generation and animation software. The new release continues MetaCreations' time-honored tradition of bringing freakish, spaced-out 3D landscape creation to the common man.

You can create HTML image maps from your scenes and create streaming 3D animations and Quicktime VR movies for the Net, including textured-terrain export for that realistic touch. Better yet, US Geological Survey maps can be imported directly for still more realism.

MetaCreations, 800-472-9025,
www.metacreations.com

Smells Like ... Victory!

In mid-April Apple continued its impressive display of financial acumen when it posted second-quarter profits of **\$135 million**, or 84 cents per share, on revenues of \$1.53 billion. The results (Apple's sixth consecutive profitable quarter) included \$50 million from the sale of 2 million shares of ARM Holdings PLC. Without this, the quarter's profits would have been \$93 million. These numbers are up from the year-ago period, where Apple earned \$55 million.

The company also announced **new iMacs** based on a 333MHz processor, up from the previous crop of 266MHz machines (which are now discontinued). The new iMacs are identical to the old except for the new chip — same 32MB of RAM, RAGE Pro Turbo graphics controller, 6GB hard drive, 24X CD-ROM drive ... and the same \$1,199 price.

Apple

continued from page 10

server core, and the BSD (Berkeley Software Distribution) 4.4 Unix operating system. The source project is called Darwin, because, as Jobs himself said, "It's about evolution."

Some in attendance pointed out that all the components cited by Jobs were already in open status, but Jobs pointed out that the release did contain some technologies that had previously been Apple-proprietary, including the HFS+ file system and AppleTalk. Additionally, he explained, Apple's engineers have been improving other parts of the software that had already been public.

What does open source mean to the Mac community? It could mean many things. The theory behind the movement is that once the source code is available (this is the raw, human-readable code from which programs are compiled, or converted, to machine language that computers read), programmers can improve on some aspects of the system, and then give their efforts back to the community. Hence, many improvements could happen quickly that might take a long time if they were undertaken at a corporation. And, thanks to a sharing and caring spirit, the resulting enhancements and ancillary programs created from the open-source code could be enjoyed by everyone.

It's a controversial topic, this open-source business, and not without its problems. Why should programmers work for free? What's in it for them? And why should a company take code they worked feverishly on and place it in the public domain where competitors could access it?

Suffice it to say there are many camps in the open-source movement. On one hand, a company stands to gain more money by keeping its products private, as users must pay a premium for them (market conditions being favorable to that scenario, of course). However, a company that opens up its products can reap substantial benefits at little cost, while aligning itself closely with its users.

"If Apple had to pay license fees for UNIX, let alone Apache, Mach, and so

forth, they could not sell Mac OS X at mass-market prices," said Rich Morin, a California programmer and author who operates Prime Time Freeware, an organization dedicated to the movement.

"So, Apple benefits greatly by being able to leverage open-source technology. But they also face a hard choice: By keeping some changes private, they might gain a bit of proprietary advantage. By giving the changes back, they gain respect in the open-source community and (if their changes are folded into the packages' source code), reduce their own maintenance burden. Also, there is a real possibility that volunteer developers will see (and perhaps fix) errors and omissions in Apple's code."

The software world is, of course, a unique industry filled with contradictions. Though it would seem unwise to give away finished products that cost millions to develop, that's happening in some areas, especially in the browser market. In these competitive times, companies are giving away software that is expensive to develop, and looking to recoup costs in other ways.

One way to keep development going while cushioning is to open the source code, which is what Netscape did with its with its Mozilla program in early 1998. This program opened much of the code for the Communicator product, and programmers around the world have been working on it since, while the Mozilla group within Netscape collects, collates, and synthesizes the changes. Many of the improvements gained through open source are integrated into later browser versions.

It should be noted, however, that Mozilla (and open sourcing in general) is not without its problems. At press time, some longtime participants were throwing in the towel, citing dissension and inefficiency within the project.

Jeff Carr, president of LinuxPPC, which makes one of several Mac versions of the Linux operating system, said Mozilla was hampered at the start because it wasn't a complete release. "It was more of a hybrid," he said, "and it was missing some

key things. They did the right thing but it would've been a whole lot better if they'd released the entire code."

Carr said an incomplete open-source release makes development prospects iffy — and that Apple's latest move is the similarly incomplete. "Apple's license on this product is too restrictive — it's not a real public license."

Enter Linux

Problems aside, open sourcing is on the rise. Look no further than Linux.

Linux is a Unix-based operating system that's been open since its inception in 1991, and it has been tweaked by hundreds of programmers worldwide. Now, it's proving to be a real alternative to commercial operating systems, most significantly among network and Website administrators who prefer it to Microsoft's Windows NT, which can be very expensive and cumbersome to maintain.

To some, cooperative development means a chance to wrest control of

Separated at Birth?

For reasons we may never fully understand, the cuddly mascots chosen by Linux and QuickTime are both penguins (Linux originator Linus Torvalds says the bird is both cuddly and contented). Coincidence ... or conspiracy? You be the judge.



software from large companies. Microsoft president Steve Ballmer says his company thinks about Linux and open sourcing as competition. At the Windows Hardware Engineering Conference, held in April 1999, in Los Angeles, Ballmer said, "There is a level of flexibility, or comfort, that people have when they have the source code. We are of course thinking with great interest about that, talking about it with our customers, and when we figure out what that means for us, we'll let you know."

At this stage, Linux doesn't pose much of a threat to Microsoft, but it is definitely moving beyond the enthusiast and

continued on page 13

Color My World

So you like the iMac colors, and you're considering some matching peripherals. It's not such a far-fetched idea. Two big-name companies recently introduced peripherals that can match any of the color of those new iMacs, be they Strawberry, be they Lime, be they Blueberry, be they ... those other two colors.

Witness the release of **Epson's Stylus Color 740i**, which is identical to the original 740 — the same 1440 x 740 dpi resolution; the same USB, parallel, and serial ports; the same letter, legal, A4, and B5 paper sizes; the same envelope, banner, adhesive, card-stock, and iron-on transfer printing capabilities — only it ships in that very relaxing blueberry iMac color.

But only the upper quadrant of the printer is colored; the bottom is translucent white. If you want to get another color to match your iMac flavor, you can order one from Epson for \$15. No word yet on a recycling program for the stock color. The 740i costs \$279, but you can get a \$30 rebate from Epson, making the cost the same as the original beige 740's \$249 price tag.

Not to be outdone, electronics maven Sony Electronics recently unveiled the Spressa USB, a CD-RW (rewritable) drive with 2X or 4X recording, 6X reading, and a 1MB data buffer — not to mention lifetime, 24-hour, free technical support, and a software bundle that includes Sony's Discrite CD-authoring software and CD Stomper for labeling.

Yeah, yeah, yeah, you say. Well, the really good part about the Spressa is that it, too, can be made to match any iMac, in a sense anyway, thanks to several small interchangeable rubber pieces that act as feet and as decor. The Spressa ships with blue feet, but you can get the other colors from Sony (free of charge) and match 'em to your iMac without further ado.

Sony's also working on a FireWire-based Spressa drive, which will also ship in June. But they won't be calling it FireWire — they call it i.LINK, which is Sony's name for FireWire. Hmph. At any rate, the \$499 drive will support 4X writing for CD-R (recordable) or CD-RW media, and will have a big 24X read speed. Yowza. It'll ship with blue feet; Sony's not saying whether it'll make the multicolored feet available, but we bet they will.

Epson, 800-463-7766, www.epson.com

Sony Electronics, 800-352-7669, www.sel.sony.com



Really Universal USB

Some multi-function USB pointing devices don't always work as they should on the Mac — but a \$20 shareware utility called **USB Overdrive** aims to change all that. This universal USB driver handles any manufacturer's mice, trackballs, joysticks, or gamepads, letting you configure them globally or specifically for an application. It handles your standard clicking, double-clicking, control-clicking, and such, and supports all types of wheels, buttons, and switches. The authors say USB Overdrive easily works with several USB devices at once.

www.montalcini.com/overdrive/index.html

Happily Ever Agfa

Delivering what it terms "best-in-class" performance, Agfa Photo recently introduced the **ePhoto CL50** digital camera, a point-and-shoot model equipped with a 3X optical zoom.

The CL50 has four resolutions: VGA (640 x 480), B/W Text (1200



x 960, black and white), High (1280 x 960, color) and Super (1600 x 1200), and four flash modes for varying light conditions. The camera's LCD viewfinder uses a prism to direct sunlight for better illumination without excessive battery use; this capability is accessed via a small door atop the camera.

A burst mode lets you take up to 10 continuous pictures in VGA resolution, at half-second intervals. Useful for capturing the action down at the dog races. The CL50's "QuickReview" function shows the user a preview of a picture, with the option to save or delete it before proceeding — this way a user can delete a photo before it's transferred to the camera's included 8MB SmartMedia card. A handy panorama mode lets you capture all the grandeur that awaits you in your travels.

The CL50 also has built-in sound recording for photo annotations and includes Agfa's PhotoWise image-editing package. The camera tips the scales at \$799.

Agfa Photo, 978-658-5600, www.agfahome.com

Apple

continued from page 11

hacker audience. At the LinuxWorld trade show held in March in San Jose, California, such big-time companies as Corel, Computer Associates, Hewlett-Packard, and Oracle were in attendance. Apple wasn't there as an exhibitor, but that might change: Several booths were showing Mac versions of Linux.

Linux on the Mac is not very similar to the Mac OS we all know and love, but nonetheless it is a powerful and versatile system. Operationally it's more like Unix than Mac, even using a command-line interface for many tasks. However, a recent improvement, called GNOME puts a much more accessible, Mac-like graphical interface on top of Unix, a move that should help the operating system gain a greater acceptance.

Current versions of Linux for Mac include MkLinux, a server product that is cosponsored by Apple and will run on older NuBus as well as PCI-based Macs, and LinuxPPC, a more full-featured package that's designed for PCI Macs. MkLinux is Linux running atop the Mach microkernel, while

LinuxPPC (now preparing version 5, with a new kernel, or core, and preconfigured with GNOME) is a "monolithic" operating system that has an internal kernel. Yellow Dog Linux is specializing in Linux distributions for PowerPC and G3 systems; and Debian previewed a version of Linux at LinuxWorld for older but still-popular Mac SEs.

Whatever happens with Linux, OS X Server, and Apple's place in the open-source movement, this is clearly an area to watch and one which will likely lead to some intriguing announcements in the near future.

Further Reading and Resources

"Darwin": www.apple.com/darwin

LinuxPPC: www.linuxppc.com

MkLinux: www.mklinux.apple.com

Linux/m68K for Macintosh:

www.mac.linux-m68k.org

Prime Time Freeware: www.ptf.com

SlashDot (emerging technologies):

www.slashdot.org

Yellow Dog, www.yellowdoglinux.com

MkLinux, www.mklinux.org

Debian, www.debian.org

I'll Have That To Go, Please

Smaller is better. Sometimes, leastways. You wouldn't want a peripheral so tiny that you'd lose it in the cushions of your couch — a real possibility these days.



Freecom's Traveller series strikes the happy medium. Take the **USB Slimline CD-R**, for example. This \$599 unit is described by Freecom as the world's smallest mobile CD-R (CD-recordable) drive. The 4X write/20x read drive has a built-in rechargeable battery and weighs 1.3 pounds. Freecom also has a larger battery-operated CD-RW (rewritable) model for \$349.

Freecom, 800-438-5336

www.storagecompany.com

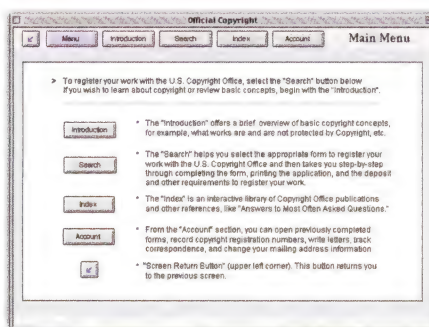
Attention Creative Geniuses

As a creative genius, you're fairly brimming with concepts that could go big. From solar-powered flashlights to screen doors for submarines, you've got a better mousetrap. You've got great movie scripts about zombies, car chases, and talking dogs good to go, as well as sweet songs of love ready to take the airwaves by storm and a new killer app for the Web.

But you've got to protect yourself from those cold-hearted pirates that would steal your ideas, and that's where **Official Software's Official Copyright** software comes in. Slap it into your CD-ROM drive and you'll have instant access to all the government forms you'll need to register literary works, software, songs, architecture, dramatic works, and visual art. But more than that, the software automates the form-filling process and provides guidance on the nuances of the copyright process, not to mention an interactive library of Copyright Office publications.

Yes, these forms are available at most libraries, but it's convenient to have them at your fingertips, along with sensible advice. Official Copyright costs \$75.

Official Software, 888-325-5445, www.officialsoftware.com



Videoactive

Another video option looms for iMacs and other USB Macs. It's **Interex's InterView**, a spritely little USB-based video-in device for composite or S-video.



Interex says InterView can digitize 30 frames per second at 320 x 240 pixels, and will also be capable of high-quality full-screen frame grabs.

For audio, the device will use a separate adapter that plugs into the Mac's microphone port. The diminutive unit, priced at \$99, will include Strata's VideoShop video-editing package. Details aren't available yet, but Interex said it'll also develop some add-on products for the converter.

Interex, 800-513-9744,
www.interexinc.com

Make Music



Macs have been making joyful noises ever since Steve Jobs pulled the first talking 128K model out of the bag in 1984. But while many people are aware of the Mac's desktop-publishing prowess, far fewer realize what a wonderful desktop music partner it can be. With just a few pieces of hardware and software, you can compose, record, and edit music on almost any Mac — even if you aren't a skilled player. Newer Macs are powerful enough to function as complete virtual studios, serving as recorders and musical instruments. In this article, we'll discuss what you need to get going, explain how the tools work, and then walk through a fun example that shows how you can use them.

It Slices, It Dices ...

So what musical feats can you accom-

plish with a Mac? Basically, anything you can do with conventional tools, such as tape recorders and manuscript paper — though that's like comparing a powerful word processor with a typewriter. Some popular applications include:

Audio recording. All Power Macs have stereo audio inputs with 16-bit resolution — the same as on CDs. (As we'll see, though, there are other factors besides bit resolution that influence sound quality.) This input lets you transfer a recording from tape or vinyl into your Mac for enhancement, or record a live performance digitally.

Multitrack audio recording. With

the right software, you can add additional parts to your stereo recording, building up massive layers of sound à la Queen's "Bohemian Rhapsody." Having each instrumental part recorded on its own track also makes it easy to adjust relative levels later — or even to replace a sour note played on one instrument.

Audio editing and mastering.

Once you get sound into your Mac, you can use editing software to snip out the bad parts, reduce vinyl pops and tape hiss, add fade-outs, and spice things up with special effects such as reverberation. Hook up a CD-R (CD-Recordable) drive and you can make your own compact discs. Some editing programs also let you save the audio in a smaller, compressed format that's suitable for posting on the Web or even for e-mailing.

Sequencing. Another popular way

with

By David Battino

Your Mac!

Here's how to set up and use a **desktop studio**



to make music is by playing a MIDI synthesizer with the computer. (See sidebar "Hello MIDI" for more MIDI info). Sequencers can record and modify synthesizer performances on a note-by-note basis, changing sounds, tempos, and keys; correcting rhythms; and much more. Unlike power-hungry audio software, MIDI sequencers can run happily on even ancient Macs.

Arranging. Perhaps your instrumental skills are rusty (or nonexistent). With a few clicks of your mouse and some autoaccompaniment software, you can still assemble complete soundtracks — handy for desktop presentations, or as *starting points for songs*.

Synthesis. Newer Macs are fast enough to create extremely realistic instrumental sounds in real time (such that the Mac can actually be "played" like an instrument). What used to require stacks of esoteric and expensive synthesizers can now be done inside a PowerBook. Laptop studio, anyone?

Music Printing. Notation software handles notes as deftly as a page-layout program handles text. You can input scores with a mouse, a MIDI keyboard, or — using Musitek's SmartScore — even with a scanner, then tweak them to perfection. "Grunt" work such as transposition and part extraction can be performed with a few keystrokes, and the parts can then be printed out with laser crispness.

Education. From chord-recognition lessons to programs that help you develop performance skills, educational software harnesses the Mac's multimedia talents to guide you to musical fluency.

Gearing Up

There are so many ways to make music with a Mac that the range of possible setups is huge. We'll concentrate here on picking the components that are most useful for songwriting.

The computer. Although almost any Mac can handle MIDI applications, digital audio programs and software synthesizers usually require a Power Mac — and often one with a 604 or G3 processor. The faster the processor, the more real-time effects (such as reverb) you can run in an audio program, and the more simultaneous notes you can play with a software synth. However, if you're only working with a few tracks of audio, you may be able to get away with a 68040-

based Mac, such as a Quadra or Centris. The iMac and the new blue G3s pose some special obstacles, however (see "Playing the Blues").

RAM is crucial for audio applications — get at least 32MB; 64MB would be better. Hard-drive speed also has a big effect. The faster the drive and the more RAM you have, the more audio tracks you can play simultaneously.

A synthesizer. There are two main ways to make music with a computer: MIDI and digital audio. The former involves using sequencer software (see "Hello MIDI") to control one or more synthesizers, which can be hardware- or software-based. The latter involves recording audio or manipulating pre-recorded audio phrases. Many sequencers can handle both MIDI and audio.

A simple MIDI setup is shown in Figure 1. The keyboard is the only sound source, so it's important that it sound good and be able to play at least 32 simultaneous notes. (This number is called its polyphony.) Other features to look for are General MIDI (GM) compatibility, which ensures that the synth will have a standard selection of sounds (but support for extended sound and effects sets called GS or XG is even better); reverb and other effects for realism; and touch-sensitive keys and a pitch-bend wheel for expressiveness.

Hello MIDI

Musical Instrument Digital Interface (MIDI) is an elegant and powerful way to make music with computers. MIDI keyboards don't send out sound; they send *data* describing what note was played and how hard it was hit. A MIDI sequencer records this information in real time, and when you play it back, your performance is recreated — like a virtual player piano.

You can build up complex orchestrations by “overdubbing” new parts in the sequencer — recording piano, then trumpet, then drums, for example. And you can edit the music graphically, dragging a wrong note to the proper pitch, fixing rhythms by snapping notes to the nearest beat, changing sounds and tempos, and more. An audio recorder can’t approach this level of control, and because MIDI deals with playback instructions, not actual sound, the files are tiny — typically under 100K.

The downside to MIDI is that the sound you get depends completely on the quality of your synthesizer and your skill as a player (or editor). And many complex, instrument voices — such as sax, guitar, and voice — are only approximated by MIDI, which was originally designed to work with piano and other keyboard-type sounds. Hence, some MIDI software now records audio.

Incidentally, you don't have to be a keyboard virtuoso to make music with MIDI. You can slow the sequencer's tempo down to a crawl when recording (the sound won't change), or even use Wildcat Canyon's Autoscore pitch-to-MIDI program to sing melodies into your Mac using the microphone input. There are guitar-, drum-, and clarinet-shaped MIDI input devices, too.

Audio gear. Figure 2 shows a basic audio setup, in which a mixer combines audio signals from various sources into a stereo signal that can be digitally recorded by the Mac. You wouldn't necessarily play every instrument at once, but having a mixer allows them all to be plugged in and ready to go at all times. The mixer also provides amplification for the microphone, which puts out a far weaker signal than most other instruments.

The Mac's onboard analog-to-digital and digital-to-analog converters — its audio inputs and outputs — sound good enough for most people. But its microphone is made for recording voice

memos, not music. (The mic is also very easy to overload, a shortcoming I occasionally exploit to create distorted vocal effects.) Serious recordists will want to buy a dedicated audio interface. These offer features such as high-fidelity converters, a variety of professional audio connectors, and — via software — support for more than two simultaneous audio inputs and outputs.

You'll get the greatest number of glitch-free tracks by dedicating a fast external hard drive to audio, linking it to your Mac with a fast SCSI card, and defragmenting it often. (Recommended minimum drive specs: 4GB size, 5MB/sec sustained transfer rate, 13 ms access time, and 7,200 rpm

rotational speed.) A capacious backup device such as a Jaz or CD-RW (CD-Rewritable) drive is a smart addition: CD-resolution digital audio gobbles up over 5MB per track per minute.

If you plan to record acoustic sounds, your first priority should be getting a quality microphone (or two). Mics sound very different, and their location relative to the sound source has a huge effect. Harmony Central's Recording page (see "Link and Grow Rich") can help you find and use the best mic for your instrument(s).

Another tip: Keep the mics far away from your Mac, or you'll risk picking up the noise from its fan and hard drives. Some people even record acoustic parts to DAT, MiniDisc, or Hi-Fi VCR in another room and then transfer the recordings into their Macs for editing.

There's a second way of working with digital audio that makes microphones largely irrelevant: the phrase-based approach. With this, you assemble brief musical loops, phrases, and sound bites from CDs onto par-

allel tracks in a multitrack audio editor. Mix the whole schmeer down inside the Mac to a stereo audio file, burn a CD, and the audio files stay in the digital domain for the entire process.

The speakers. Consider spending as much on your audio monitors as you did on your video one. Hearing an accurate representation of your music makes a dramatic difference. Run your sound through your home stereo if you can; all it takes is a \$5 Y-cable from Radio Shack. Incidentally, headphones are a useful complement to good speakers, not a replacement. [For more on speakers, see our comparison in this issue.]

OMS and FreeMIDI. Most programs that make use of MIDI require one of two free system extensions to work its magic. The most widespread is Opcode's Open Music System (OMS) which is used in Opcode's own MIDI programs and many others (see The Mac Maestro's Toolkit, this issue, for a list of software). The other is Mark of the Unicorn's (MOTU) FreeMIDI, which is required for that company's software.

These extensions enable your Mac to recognize and control external MIDI hardware, or to work with Apple's QuickTime Musical Instruments exten-

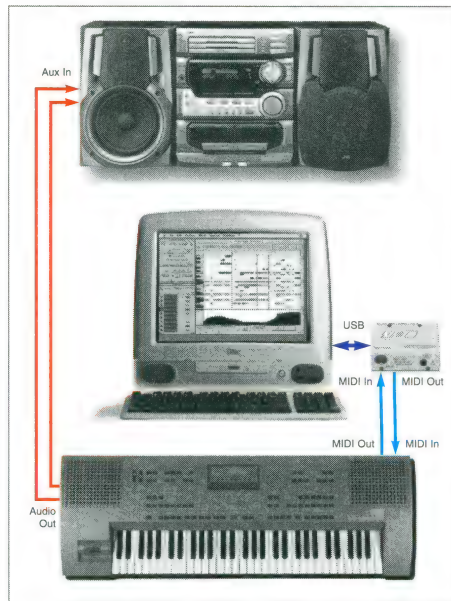


Fig. 1. In this simple MIDI system, performance data from the keyboard flows through the MIDI interface to the Mac, where it's recorded by the sequencer software.

Sometimes *faking it*
is better than the real thing



*Now your Mac
can do Windows*



Connectix Virtual PC enables your Mac to run the latest PC software including business, game, and home applications. You can purchase Virtual PC with DOS®, Windows® 95, or Windows 98 included. Just install Virtual PC to increase your capabilities beyond the Mac OS. No additional hardware required.

Buy it now

at your favorite computer stores or at www.connectix.com
For more info call: 1800 950 5880



Playing the Blues

While the iMac and the new blue G3s are powerful enough for any musical task, their innovative designs pose some potential problems. To connect a MIDI instrument to an older Mac, for example, you first attach a MIDI interface to the Mac's modem and/or printer ports. The new Macs don't have those ports, only USB ones. Although USB-based MIDI interfaces are shipping, you'll need a special serial-to-USB converter to use an older interface with a new Mac — and only converters that support external clocking (synchronizing external devices with the Mac; used for devices that need precise timing) will work. USB pioneer Opcode Systems reports that Griffin Technology's gPort and iPort have tested well so far, though the latter works only with first-generation iMacs.

The iMac's lack of PCI expansion slots and SCSI limits its usefulness for serious digital audio recording, too. You can't add a high-quality audio card (although simple USB audio interfaces should appear later this year) or a fast external hard drive. Backing up large audio files over pokey USB is tedious, too.

sonor other products that provide software-based sound. Both FreeMIDI and OMS are being continually updated to recognize and support the latest MIDI gear, so make sure you get the latest versions from Opcode or MOTU (www.opcode.com, www.motu.com). Both companies have recently added support for USB to these extensions.

Setting up your MIDI system with OMS or FreeMIDI can be exceedingly simple, but it can also be confusing. Both have automated setup utilities that search your setup and provide a graphical representation of which software and

devices that are present. If a device is not recognized, you may have to do some digging and tweaking of the setup to make certain all your keyboards, modules and controllers are recognized. If the automated setup doesn't work or won't recognize all of your instruments and accessories, you're in for a little manual reading,

Action!

To illustrate how all

these tools work together, I'll walk you through a song I did recently. First I generated some two-bar drum patterns in Steinberg's ReBirth software and saved them to disk as stereo audio files. Next, I imported the files into Opcode Studio Vision Pro (a MIDI sequencer/digital-audio recorder) where they occupied several tracks, and slid them back and forth on the timeline until I had them in the order I wanted. Using BIAS's SFX Machine, an effects plug-in, I filtered some of the sounds for a lo-fi effect.

My two-year-old son wandered into the room, so I handed him the Mac's microphone and let him babble a bit. I highlighted the good parts and dragged them into new tracks. Firing up my keyboard synthesizer, I recorded a bass line, a string part, and additional percussion into Vision's MIDI tracks. The percussion rhythm was a bit sloppy, so I used Vision's Groove Quantize feature to tighten up the timing.

The piece needed guitar. I could have played a

simple MIDI part, printed it out as notation, and recorded a real guitarist playing, but I was on a roll. Instead, I imported some of Keyfax's Twiddly Bits MIDI files (short phrases recorded using MIDI guitars and pro players). They were in the wrong key, so I hit Vision's Transpose button. Badda-bing!

Plugging the output of my mixer into the Mac's audio input, I recorded the existing audio tracks plus the synthesizer's output to a new stereo track in Vision. Not yet having a CD recorder (I'm waiting for the FireWire models), I then recorded this track to cassette. This way I can check the mix in my car as well as home.

Invariably, when listening on different speakers, you find that certain parts are too loud, soft, or reverberant. With your music safely on your Mac, you can tweak the mix until it sounds good on a variety of systems, and until the royalty checks start clogging your mailbox. **MII**

David Battino bought his first Mac in a music store. He is editor of Intertec Publishing's Desktop Music Production Guide.

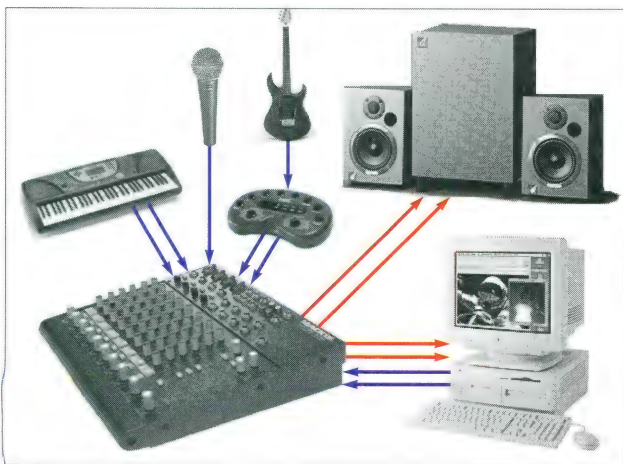


Fig. 2. A mixer makes it easy to record and manage multiple audio sources by combining them into a stereo signal that can feed the Mac. The kidney-shaped device is an effects box that amplifies and enhances the guitar signal.

Link and Grow Rich: Online Studio Resources

Apple USB MIDI products page

www.apple.com/publishing/music/midi/

Cakewalk Desktop Music Handbook

www.cakewalk.com/Tips/Desktop.htm

DAW-Mac (digital audio workstation newsgroup)

www.bakalite.com/Pages/DAW-Mac.html

Harmony Central Recording page

www.harmonycentral.com/Recording

How to Buy a Synth

<http://metalab.unc.edu/mcmahon/emusic-l/info-docs-FAQs/buying.the.first.txt>

Music Technology Buyer's Guide

www.mtbg.com

Studio Guru (listing of links)

www.studioguru.com/indexN.html

A P O L L A

S P E A K E R S™



Grape

The Sound You Need.



Bondi Blue



Blueberry

The Colors You Want.

PELE
ENTERPRISES

For more information:
www.pelezone.com

©1999 PELE Enterprises, LLC. All rights reserved. Apolla Speakers and PELE Enterprises are trademarks of PELE Enterprises, LLC. Macintosh, Power Macintosh G3, iMac, Mac and Mac logos are trademarks of Apple Computer, Inc., registered in the U.S. and other countries. For more information about PELE Enterprises' products call 804.340.0820.

ONLY \$49.99

- Superior Audio for iMacs and Power Macintosh G3s
- Essential for Games, Multimedia and Music CDs
- Produces Rich Bass and Precise Highs
- Designed for Home and Office Use





Audio

School

By Anne Marie Feld

The basics on speakers and the Mac

Most people find the built-in speaker on Apple's computers a little lacking. In fact the words that come up most often when you ask people about those speakers are — excuse the professional jargon — “they suck.” But getting rich sound for music or multimedia applications isn't necessarily an expensive or especially difficult proposition. For as little as \$50 you can get speakers that will blow away Apple's like William Tell with a high-powered rifle. We tested a dozen sets; here's what we found.

Pele Apolla Speakers

\$50



They beat the built-in speakers on the iMac we used for testing, but that's not saying much. Pele's **Apolla** speakers may have good looks that glow in the afternoon sun (the color is designed to complement the iMac; their translucent cabinets come in all the fruit flavors) and a friendly price, but it's counter-punched by weak bass response and a less-than-crystalline treble report. At top volume, there is no distortion, but it wasn't all that loud — you could easily order a pizza over the phone with music playing at top volume a few feet away. They're feather light, and the only control they offer is on/off. Unless matching your iMac is your top priority, these might be ones to avoid.

4 watts per channel

804-340-0820, www.pelezone.com

Labtec LCS-2414 \$50



Most speakers in this price range don't come with a subwoofer, but the **LCS-2414** set is an exception. They deliver nice clarity and separation, though they're not tremendously loud. The subwoofer is approximately 11 inches by 8 inches, but delivers thumping bass, plenty to make the floor buzz. In this price category, the LCS-2414 is the easy winner, delivering a fuller sound than the similarly priced JBL speakers. It does a good job of capturing the high range, though some might find the sound a little harsh. The Cozo speakers, at twice the price have a more powerful amplifier, but the Labtecs offer more range and articulation of sound.

5 watt satellites/15 watt subwoofer

360-896-2000, www.labtec.com

JBL Media 100 Loudspeakers \$60



Even at the low end, the **Media 100s** reproduce sound admirably. They have better bass reproduction than the Cozos' more mid-range sound and more than most of the others in this price range. No distortion at top volume, but it's

probably not loud enough to get the neighbors after you. There is a tone control, but it doesn't have much effect.

These self-contained speakers do a good job for the price, with sparkly, well-defined sound. Like its big brother, the Media 200, the Media 100s will turn off after twenty minutes when the computer has no sound output.

6 watts per channel

516-496-3400, www.jbl.com

Yamaha YST-MS28 \$80



This subwoofer-satellite set may be tiny, and they may be comparatively weak, with only 25 watts of total power, but these **Yamahas** have a lot going for them besides their good looks. Setup is easy; satellites have little angleable feet that are also suitable for wall mounting, or if you prefer them to be freestanding, they can be used to angle the speakers vertically. They've got multiple inputs: nice if you want to plug in something else, such as a television or a stereo.

They don't have a great deal of volume to recommend them, but the sound quality is excellent, and the subwoofer, even at half volume, made the desk vibrate. These are high-performance, sleek-looking speakers for the price — an excellent choice for an office or a quiet home.

5 watt satellites/

15 watt subwoofer

714-522-9011,

www.yamaha.com

Philips MMS280 \$90



It's got bells; it's got whistles. Philips **MMS280** has Philips' Incredible Surround 3D audio, dynamic bass boost, magnetic shielding, two satellites and a subwoofer, and a fair amount of power, but the sound isn't very well defined. The bass was a fuzzy and, though it performed well at low volumes, the lack of tone controls made it too muddy at top volume for our tastes. We also experienced some hiss, which was not the case with any other speaker

we tested. The subwoofer has its own volume control, but it is directly tied into the volume on the satellites, so if you love bass and were hoping to use that as a control, think again. Setup was a little difficult — not quite as streamlined as some of the other models we tested — but certainly not brain surgery. The speakers are actually quite small, though the cases are quite big, and volume is controlled by large silver knobs that inspired *MacHome*'s editor-in-chief to proclaim them Gobot-like.

40 watts total output

212-850 5000, www.philips.com

JBL Media 200 Loudspeakers \$99



The JBL **Media 200s** are not highly directional, so the speakers sound good from a wide range of positions and distances. What they lack in a subwoofer,



they make up for in highly effective bass and treble controls. They also have a bass port in the rear of the cabinet (something like a rear-audio window on the speaker) which helps considerably with bass definition. The woofer and tweeter are separate, something not usually found in speakers at this price. They have a large footprint for speakers of this category, and like the JBL media 100s the design is a trifle dated, though still attractive.

10 watts per channel

516-496-3400, www.jbl.com



Cozo speakers \$100



There's no denying that they're cute, with their translucent bondi-blue cases of modular plastic. Soundwise, they have nice separation, but they only offer volume and balance control, and at this price something more sophisticated seems in order. Sound is a bit muffled and bass heavy. And though they performed well at top volumes without distortion, they simply didn't have enough power to compare with the other speakers at this price point. Directionally, we found that the **Coxos** didn't perform well — until we turned them upside down onto their sloped little backs, and experienced a vast improvement. Again, if color coordination is your thing, these may be the way to go, if you have an early, bondi-blue iMac, but you can get more for your money if you're willing to compromise on decor.

10 watts per channel

www.cozo.com

Labtec LCS-2632 \$100



Winner of the best sub-\$100 speaker category, the Labtec **LCS-2632s** hold their own across the spectrum of speakers we tested. Wattage output is not huge, but the sound is, helped along by "Spatializer" 3D surround sound technology. This technology expands the sound-bubble, but it is slightly tinny at the high end. They've got a good deal more power and volume than the lower-end Labtec LCS-2414s and other speakers we looked at, and produce clean, sparkly sound. Bass and treble controls are located on the front of the sub-

woofer, which can be a trifle inconvenient, depending on where you place the speakers. The design is quite nice, with a small footprint, and the speakers have an interesting molded shape. The subwoofer is a rectangle that looks like it's been tweaked in Photoshop, resulting in a stretched, futuristic shape. They also come with brackets so you can mount the speakers to your monitor. But the bottom line here is sound, and the LCS-2632 delivers.

6 watt satellites/20 watt subwoofer

360-896-2000, www.labtec.com

Labtec APX-4620 \$149



There are some nice additions to this speaker system over the Labtec **LCS-2632**. Controls are on the right-hand speaker rather than on the subwoofer. Microphone and headphone inputs are also located in the speaker. Other inputs reside underneath the speaker itself — nice if you find wires unsightly. It's got "Variable Spatializer" and "3D Imaging," which promise sound that feels as if it's coming from a multitude of directions and, in practice, deliver this effect fairly well. Vocals are crisp and pleasing, and bass and treble controls are responsive. The subwoofer is huge — the size of a 15-inch monitor — and in an odd design quirk, the speaker power is located in the back of the subwoofer. If you keep it stashed under a desk, this can be trying. Speakers are beige, like the other Labtecs, but here the subwoofer is black.

However, the lower-end Labtec LCS-2632 is similarly adjustable, has a more pronounced bass, and richer overall sound in our opinion. They also delivered more in terms of volume, so in this case, your money doesn't necessarily buy you more. 13 watt satellites/44 watt subwoofer 360-896-2000, www.labtec.com

Polk Audio AMR5 \$199



With a shape that French designer Le Corbusier would have envied, the **AMR5s** (termed the "Orgasmatron" here at *MacHome* for the subwoofer's

likeness to a certain item in Woody Allen's *Sleeper*) sound terrific — when they make sound. The connections on the unit we tested were a bit loose, and the power source wouldn't stay in unless held in place, but it looked as though the demo model had been around the world a few times. Sources at Polk assured us that this was an aberration. The subwoofer is powerful and has its own volume control, and satellites have very effective bass and treble controls.

The sound is crisp — sharp with terrific separation, nice adjustability, and excellent articulation/clarity. They're not, however, the easiest things to set up. It's all too easy to mess with the inputs and start getting whale sounds over your music; color-coded cords would have been a bonus.

18 watt satellites/32 watt subwoofer

800-377-7655 www.polkaudio.com

Altec Lansing ADA 880

\$330



It may not have the sleek design of a Bang & Olufsen stereo (or even a 20th Century Mac), but the Altec Lansing sys-



Polk

tem delivers big on sound. With a total of five speakers — four satellites (two main satellites and two diminutive surround-sound modules) and a subwoofer, the **ADA 880** takes full advantage of Dolby Digital AC3 Surround Sound technology (though not all media does; look for more of this as DVD becomes more prevalent). Sound is lush and full, and having the speakers positioned in a square around the listener provides more

sound separation than anything we tested. Not only that, the subwoofer is large enough to double as an ottoman/foot massager. Color-coded cords make installation a breeze, and notches make sure that you position cables correctly. This is especially important with cables utilizing easily bent pins.

Another nice design feature is that the surround-sound modules can be attached to the top of the main satellites. There are soft, removable fontanelle covers into which they fit neatly. Disadvantages? Volume is affected when you choose to go Dolby — spreading the power to four separate satellites takes a toll.

10 watt satellites/40 watt subwoofer
800-ALTEC88, www.altecmm.com

Pioneer HTV-1 \$399



Formed in the shape of one long, black cylinder the size of a party hero sandwich for ten, the Pioneer **HTV-1**'s head unit is not meant specifically for use with a computer. It would be fabulous for use with a wide-screen TV, but the speakers, when used with a computer, are too close for good listening. It's best suited for someone who has a media cabinet that contains a **television**, stereo and computer all in one place, preferably with a shelf on top, so

that the speaker can be moved to emanate from above the computer or television, depending on usage. It has a remote that looks like a scientific calculator and can drive TVs, DVD drives, computers, and satellite dishes. It's powerful — loud enough for use at a raucous party, boasting a massive subwoofer the size of a college dorm refrigerator. It has a nice, rich sound, and extensive controls, but unless you want it to serve as a slave to many masters, the other units work better for computer use.

30 watt per channel/60 watt subwoofer
800-421-1606, www.pioneerelectronics.com

Speaker Specs

Of course, the best way to learn about speakers is to go and hear them. Sound quality is highly objective. Here's what you should look for.

1. Pick a CD — try one that's highly produced — we used Pink Floyd's *Dark Side of the Moon* and REM's *Up*. **Try the same song** on a variety of speakers. **Listen for quality reproduction** of high-range, mid-range, and bass. If you like to tweak controls, make sure that the **subwoofer** you choose has its own **volume control** and look for speakers that allow you to **customize the sound** to your taste. **MII**

Editors' Choice: Speakers

Best Overall Sound Altec Lansing ADA 880

Cadillac of sound, with a price tag to match (\$330), the Altec Lansing is living large. With bass power any low-rider owner would envy, and Dolby Digital five-piece speaker system, this is by far the best system we looked at.

Best Sub-\$100 Sound Labtec LCS-2632

Labtec made a strong showing. The slightly lower-end LCS 2414 (\$50) came close, but lost out to the LCS 2632's bigger subwoofer and additional controls for bass, treble and surround sound push this forward to the top of the sub-\$100 pile.

Best Looking Yamaha YST-MS28

They're tiny, yes, and maybe lacking a bit if you're looking to pump up the volume, but these svelte little speakers look great and reproduce sound well, though some might find them overly emphatic at the high range.

Honorable Mention JBL Media 200

Excellent bass and treble controls let you adjust things to your personal preferences. These speakers, despite their lack of a subwoofer, produce booming sound (10 sounds like 11) with a minimum of distortion.



**The object above
is a PDA, a desktop
satellite dish, or a new
flat panel speaker?**

**It's the world's first flat
panel multimedia speaker.**

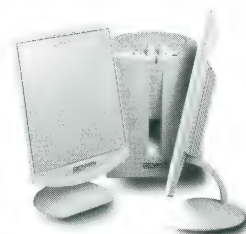
You have to hear them to believe them.

Instead of a cone, a .25mm flat panel vibrates, projecting sound 360°.

It's the greatest advance in audio since the invention of the speaker itself.

For computers, home and portable stereos, stereo TVs and cd players.

**Call 1-888-9BENWIN to order, or visit
our on-line store at www.benwin.com**



The BW2000 speaker system, with two flat panel speakers and a subwoofer, retail priced at \$99.⁹⁹
Full money back guarantee.*

BENWIN[®]
The new shape of sound™

The future of audio is available now from Benwin, the new leader in flat panel speaker technology.

1-888-9BENWIN
www.benwin.com
626-935-8888

*Less shipping and handling.
© 1999 Kwong Quest, LLC. All rights reserved. Based on NXT technology.
NXT is a trademark of New Transducers Limited. MHome4.99



The Mac Maestro's Toolkit

By John Poultney

Music Software and Hardware for All

Options abound for amateur and professional musicians alike when it comes to digital audio and MIDI (musical instrument digital interface) setups. Here's our list of software and hardware that's sure to set your foot a-tapping.

Don't let anyone tell you there aren't any cool applications for the Mac. Trying to sort through the vast array of music apps that are available for this platform is overwhelming. Why such an embarrassment of riches? Because the Mac is the dominant platform in music circles. Though Wintel PCs have made quite a few inroads in recent years, the Mac's early inclusion of high-quality audio gave it a big head start on the competition.

This list includes most of the major players in digital audio and MIDI sequencing products, but is by no means exhaustive. We've included products that are mostly at the consumer level, but there's a whole other level of software and hardware aimed at professional musicians, composers, and producers. Some of the high-end stuff gets mighty expensive — as in many thousands of dollars. We've tried to keep this listing to the more-affordable products. **And a-one, and a-two ...**

Software

Music software generally falls into two basic categories: MIDI sequencing and digital audio.

MIDI sequencers (so named because they arrange sequences of notes) are used for composition and/or playback of MIDI files. They typically work with outboard gear called MIDI sound modules, which hook to a separate interface connected to your computer. MIDI modules hold sound samples that are triggered by messages from the interface, which in turn connects with the software on your computer (for more on MIDI, see "Hello, MIDI, page 16).

Digital audio packages record actual sounds into your Mac and let you edit or layer them (multitracking) once they're in. There are also some packages that combine digital audio with MIDI, so you can use MIDI for backing tracks and digital audio for such things as vocals and guitar.

Opcode

Systems has packages for all levels of musicians. The \$99 MusicShop is a rudimentary, easy-to-use MIDI sequencer that includes about 100 sample MIDI files to play with. More substantial is the company's Vision line. Vision DSP offers sequencing and audio recording for \$495, while the \$995 Studio Vision Pro offers these and many other features aimed at the music professional. Opcode is working on other variations of the Vision line, including a MIDI-only version.

Opcode also makes the free Open Music System (OMS), a system extension that's required to run its programs and a lot of other music software.

Mark of the Unicorn

(MOTU) also has a variety of beginning and advanced products, including the \$195 FreeStyle, a MIDI package for basic sequencing needs, and the more full-featured Performer for advanced sequencing needs. This \$495 program handles MIDI and eight tracks of audio, while the \$795 Digital

Performer handles MIDI and as many digital audio tracks as your Mac's processor can muster.

MOTU also makes Mosaic, a \$395 program for professional music notation, and FreeMIDI, a free system extension needed to run its programs.

Steinberg USA

makes the \$99 Cubasis AV package for MIDI and eight audio tracks, the mid-range Cubase VST (\$399), and the \$799 Cubase VST/24; the latter are professional-level. Steinberg also markets Re:Birth, an intriguing software

approximation of a classic analog-style synthesizer, which costs \$195, and X<>Pose, a \$399 program that triggers QuickTime movie playback from MIDI devices, and is useful for live performances.

EMagic's MIDI offerings include the enigmatic Logic Audio, a complex MIDI/audio program with a large number of parameter controls; it's available in Silver, Gold and Platinum editions, with varying feature sets, for \$299, \$499, and \$799. A simpler, low-cost version called MicroLogic AV costs about \$100.

Arboretum markets a dizzying array of music software. The \$299 MetaSynth lets you "paint" with sound or convert PICT graphics to sound. The \$179 Xx is a companion MIDI sequencer for MetaSynth, though it can be used alone. Arboretum's \$249 Hyperprism generates a wide variety of sound effects in real time, using an innovative X-Y coordinate system. Other products include RayGun, a \$99 noise-reduction package reviewed in *MacHome's* May 1999 issue, and Ionizer, a \$499 "frequency morphing" package for

audiophiles. The company recently released Harmony, a \$350 program that adds harmonies onto melody lines.

Berkley Integrated Audio

Systems (BIAS) offers two very good general-purpose audio packages: the \$399 Deck and the \$499 Peak, now at version 2.0. A limited version of Peak (the \$99 Peak LE) is sometimes included with some CD-Recordable drives. Peak also supports the RealAudio format, for those interested in preparing their music for Web distribution. BIAS also makes the SFX Machine, a \$300 software synthesizer for making sound effects.

Cakewalk Music Systems makes the In Concert auto-accompaniment program. This \$199 package lets you play a keyboard part along with a MIDI file, which modifies its own playback speed and structure based on your playing. Cakewalk also makes the very cool Metro 4 MIDI sequencer (reviewed in the August '98 issue), which includes digital audio and notation functions, for \$249.

PG Music's \$88 Band-in-a-Box, now at version 7, is a compelling auto-accompaniment program. Based on chords you select, this software generates patterns for you to play along with. Its automatic soloing function generates solo lines based on the styles of well-known musicians.

The Singing Mac

KAE Labs' VocalWriter is an amazing bit of software that makes your Mac a singer.

Combining your Mac's speech synthesis capabilities with sophisticated MIDI sequencing and sound synthesis functions, this \$99 shareware package is a winner. Instead of substituting instrument parts for a song's melody, you can just input the lyrics directly. The resulting output doesn't sound entirely natural, of course, but it's surprisingly good. Vocals can be layered for choral effects, and the software also supports the MIDI Karaoke format, for that ever-popular "follow the bouncing ball" effect.

KAE Labs, www.kaelabs.com



Bitheadz makes two intriguing software synthesizers: the \$259 Retro AS-1 and the \$500 Unity DS-1. The former is a synthesizer; the latter is a sampler that reads sound samples and stores them in RAM. Both let you squeeze a maelstrom of sounds from the innards of your Mac. Mikail Graham, a musician and composer in Nevada City, California, is highly enthused about Unity DS-1. "Once I discovered the DS-1 and set it up on my Mac, I ended up selling some expensive sampling hardware that I'd used for the same purposes," he said.

Native Instruments is also readying an intriguing software synthesizer called Generator, which should be ready by the time you read this. The \$298 program has modular construction, with separate sections for various synthesis operations; "step" sequencing (a method of composing tracks without needing to play parts in real time); and audio effects. Native also offers Transformator, a software sampler, for the same price.

Koblo's software synths recreate the sounds of early electronic instruments. The company's products include the Vibra9000 synth, and the Stella and Gamma samplers. Stella is made primarily for string and choir sounds, while Gamma is designed for drums and percussion. All are \$149, except the Vibra6000 (a stripped-down version of the 9000), which is \$75. Koblo also has a free "micro" version, the Vibra1000.

ARS Nova's Songworks II is a simple MIDI-capable composition program for \$125; the company also makes the \$75 KidMusic and the \$99 Practica Musica, a full-featured music education program.

ProSoniq offers SonicWorx Artist, a sound-design and effects-processing package, for \$199, and SonicWorx Studio, a \$498 package with professional sound-design and restoration capabilities

Musitek's \$399 SmartScore brings OCR (optical character recognition) scanning to sheet music, letting you scan in your sheet music and then convert it to MIDI files.

Hardware

You don't really need external hardware to use most music software on your Mac (see sidebar "QuickTime Musical Instruments"), but you'll get much better results if you do. There are two key components if you go this route: a MIDI interface, which connects to your computer, and a MIDI module, which makes the actual sounds that are triggered by your MIDI files. Start getting fancy with digital audio, and you might need some additional hardware; we'll discuss this in a minute.

MIDI Interface: This piece of hardware contains MIDI ports, which connect directly to MIDI modules, keyboards, and other devices, and a serial or USB port to connect to your computer. Here are the major manufacturers:

Opcode makes the \$59 MIDI Translator II (one MIDI port in, three out) and the \$109 MIDI Translator Pro (two in, six out). These devices use standard serial ports, but at press time Opcode was readying the MIDIport line of USB interfaces. Prices weren't

available yet, but there are four-port and eight-port versions. Opcode also makes the \$250 DATport, which routes CD-quality digital audio through USB, and a variety of more-professional equipment.

MOTU makes a large variety of hardware, including the \$59 FastLane, \$165 Pocket Express, \$295 Micro Express, and the \$395 MIDI Express

XT, and more-expensive and sophisticated devices, such as the \$595 MIDI Timepiece AV and the \$995 2408, a 24-channel digital audio interface for professional use. The company has announced USB support for its whole product line; these units will have both serial and USB interfaces and be priced the same as the prior models.

Roland and **MidiMan** both have USB MIDI interfaces now. Roland's is the \$250 S-MPU64 (reviewed in this issue); MidiMan's entry is the \$130 USB Midisport 2x2.

eMagic's Unitor8 is a high-end rack-mount interface with eight MIDI channels, priced at \$600.

MIDI Modules: There's a huge variety of these to choose from, and since they're not Mac specific, we

QuickTime Musical Instruments

A traditional MIDI setup involves connecting your computer to a MIDI module, a hardware device that holds sounds. Your Mac sends instructions to the module, which in turn plays the actual sounds in the correct sequence (hence the term "sequencing.") However, Apple's QuickTime includes an system extension called QuickTime Musical Instruments, which lets you run MIDI sequencing software without needing to hook up any outboard hardware to your system. This extension contains sound samples licensed from Roland, long a dominant player in the music equipment business.

Roland's \$49 Virtual Sound Canvas ups the ante. This software does the same thing as QuickTime Musical Instruments but with much higher quality, because the samples are larger. The package, in fact, is said to be the software version of Roland's Sound Canvas MIDI module. The sound quality won't be as good as you'd get with external hardware, but it's a definite improvement over the system's built-in sounds.

won't list products here. You can find these from such manufacturers as Roland, Yamaha, E-Mu, Korg, AKAI, and many others; check out www.harmonycentral.com for a good list. Some modules specialize in standard MIDI soundsets, while others store sounds from special gear, such as vintage keyboards or Latin instruments.

Pro Hardware: As we mentioned, you can do fine without using additional hardware on your Mac, but most professionals like to boost their system's capabilities when it comes to handling audio signals. The Mac's built-in circuitry handles stereo audio pretty well, but additional hardware comes in mighty handy when working with multiple channels, as is done with professional sound and film work.

Digidesign has long been the granddaddy of Mac music gear. The company's thrust these days is Pro Tools, a hardware/software combination that provides multichannel recording, editing, and synchronization functions. System prices depend on configuration and can range from a couple grand to tens of thousands of dollars. Digidesign also makes the Audiomedia III card (around \$700), for less-demanding projects.

Several manufacturers make PCI cards for multichannel digital audio. **Korg's** \$500 1212 I/O gives you 12 channels in and out, as the name implies, while **Event Electronics'** \$399 Darla and \$599 Gina PCI cards provide multichannel audio as well (Event has just recently released Mac drivers for these products). **Emagic** makes the \$799 AudioWerk 8 card, which provides two channels in and eight channels out. **Lucid Technology's** \$450 pci24 provides high-quality digital audio in and out options for PCI Power Macs; the company also makes the \$400 NB24 card for earlier NuBus Macs.

As this list shows, Mac music has something for everyone. The best part: Mac music setups can evolve along with your abilities. Most of the products start off is fairly reasonable, though in the professional realm, things get more expensive as you prepare for the next measure. **MIDI**

Company Listing

Arboretum Systems
800-700-7390
www.arboretum.com

ARS Nova
800-445-4866
www.ars-nova.com

BIAS
800-775-2427
www.bias-inc.com

Bitheadz
425-742-1518
www.bitheadz.com

Cakewalk
888-225-3925
www.cakewalk.com

Digidesign
650-842-7900
www.digidesign.com

Emagic
530-477-1051
www.emagic.de

Event Electronics
www.event1.com

Koblo
www.koblo.com

Korg
www.korg.com

Lucid Technology
650-429-2400
www.lucidtechnology.com

Mark of the Unicorn
617-576-2760
www.motu.com

MidiMan
800-964-6434
www.midiman.com

MUSITEK Corp.
800-676-8055
www.musitek.com

Native Instruments
800-665-0030
www.native-instruments.com

Opcode
425-742-1518
www.lucidtechnology.com

PG Music
800-268-6272
www.pgmusic.com

Prosoniq
www.Prosoniq.com

Roland
800-3870-2580
www.rolandcorp.com

Steinberg USA
818-993-4161
www.us.steinberg.net

Thanks to San Francisco's Computers and Music (www.computersandmusic.com) for help with this article.



REALbasic

2.0

Turn your ideas into applications

For Macintosh and Windows

Whether it's a small utility, a large application or the next great game, REALbasic lets you turn it into a reality. REALbasic is easy for beginners, yet powerful enough for professional developers.

Download a FREE trial version at
www.realbasic.com or call
512.263.1233 for more information

 **REALbasic™**

REALbasic is a trademark of REAL Software, Inc.

The Palmtop Office

Handheld Computers Keep You Connected

Palmtop computers are enticing gadgets, promising extensive powers in small, portable sizes. You can easily slip them into a pocket, and they don't weigh much more than a chocolate bar. Since the demise of the Newton, 3Com's Palm Pilot has been a popular choice, but with the release of much improved Mac software, it now holds the stage as the *de facto* palmtop for the Mac.

Let's take a look at how your office would fare if you had one of these devices in hand.

The Organizers Formerly Known as Pilots

Due to some formal complaints issued by the makers of Pilot pens, 3Com doesn't use the word "pilot" anymore, but instead refers to its palmtop computers as "Palm Connected Organizers," an apt, but inordinately dry moniker for tools as slick as this. The Palm, as one might expect, fits in the palm of one's hand, and you control it by using a stylus on its touch-sensitive screen. When you're back home, it connects to the Mac by means of a cradle and serial cable (owners of iMacs and new G3s will need to make use of a serial-to-USB converter, such as the Keyspan serial adapter reviewed last month). You can also connect to the Mac from afar, using a Palm Pilot modem, a small add-on that snaps onto the bottom of the Palm and costs about \$129. Whenever you connect the Palm to your Mac, whether by direct serial connection or using the modem, it undergoes a process called "synching," in which

newer files overwrite older files on either the Mac or Palm. You can also use the modem to dial into an ISP and open an Internet connection, making it a very handy and inexpensive method of sending and receiving e-mail when you're away.

Currently, 3Com offers a wide range of Palms — the Professional for \$199, the Palm III for \$299, the Palm IIIx for \$369, and the Palm V for \$449. All require the purchase of a \$15 MacPac, which includes software and a serial cable. The Palms are differentiated primarily by memory, and for these computers, memory doubles as storage space. A little memory goes a long, long way in the Palm. The Professional has 1MB, which, by 3Com's estimates, is capable of holding about

4,000 contacts, 2,400 appointments, 750 to-dos, 750 memos, and 100 e-mails. The Palm III, which has 2MB of memory, is capable of holding proportionally more than that. Similarly, applications can take up about 150K, but most tend to take up only about 2 or 3K.

Aside from RAM, there are other differences between the Palms. The Palm III adds an infrared port, with which you can beam data back and forth to other Palm Organizers. You can upgrade the Professional to a Palm III with a kit that costs about \$100, which also provides the infrared port. The Palm IIIx, in addition to having

2MB more memory than the Palm III, has an improved, sharper screen.

The Palm V is an entirely different, more stylish animal. It has the same screen as the IIIx and 2MB of memory, the same allotment as the less-expensive Palm III, but it's

thinner and lighter than the other Palms. Because it sports a glitzy, anodized aluminum case rather than a humble plastic one, it's most likely of all the Palms to appear in the next James Bond movie.

Because of the small file sizes on the Palm, and because all data is stored in RAM rather than on a hard disk — which uses many moving parts that



grind and moan and groan whenever you need to access a byte of data — most operations, including searches, take less than a second. Also, you never have to Save files or Quit applications; when you close a file, it's "saved," and when you turn on the Palm, it opens to the screen you were on last. Also, you can imagine how quick and painless it is to download applications from the Net and add them to your Palm, when you're talking only a couple of kilobytes.

Small though it may be, the Palm is a computer in its own right, with its own operating system. Like that of the Mac, the Palm OS provides you with a visual, menu-driven interface, and although it's very simple and sparse, it allows you to organize your files and applications with much flexibility. Palms come pre-installed with a good selection of useful tools. The Palm III, for example, comes with Address, for your contacts; Calculator; Date Book; Expense; Mail, for reading and writing e-mail; Memo Pad, for writing notes; and To Do List.

By installing special software on your Mac that Palm calls "Conduits," you can transfer information back and forth between the Palm and your Mac. The most important Conduit, the Installer, allows you to install additional applications from your Mac to the Pilot. Many Palm applications don't have a desktop component — once you install them on your Palm, that's the end of the Mac compatibility requirement. But other programs, such as scheduling software, have a Mac component as well as a Palm component, and programs such as these require their own Conduits.

In terms of software that resides only on the Palm, there is an incredibly huge selection and variety, as a glance at Palm Central (www.palmcentral.com) will show you. Most of these programs will be compressed using the .zip format, so be sure to download ZipIt, a handy utility that's available on most shareware sites. There is a fair sampling of Macintosh conduits. Their number should be steadily

increasing, aided by Palm's recently released Mac Conduit Developer Kit, which should make it incredibly easy for software developers to add a Mac Conduit. For a list of Mac developers for the Palm platform, pay a visit to www.palm.com/products/macintosh/.

The abundance of accessory gear for the Palm is also astounding. You'll find styluses and cases of every description, and a Palm-oriented leather jacket. Qualcomm has plans for a Palm/cell phone combo, and Landware produces a miniature keyboard into which the Palm docks.

Using the Palm

One of the more brilliant aspects of the Palm OS is the way it handles text entry. Rather than hunting and pecking your way through a set of calculator-sized keys, you draw the text on the screen with your stylus. This is accomplished by writing in a text-entry box at the bottom of the screen, using letters from a stylized system that Palm Computing calls Graffiti, and the typeface letters appear above, in your document. So you don't have to worry about placing the letters, and you can easily write standing up and in challenging, turbulent settings, such as on a New York subway car or a San Francisco bus.

And because Graffiti uses a stylized code for character recognition, you can draw the characters in a variety of sizes and with a lot of latitude in the text-entry area in order for the letters to be recognized. Graffiti takes patience to learn, but if you can get through the three or four days it takes to do so, you'll find that it's intuitive, easy, and slick. This is a

rating 

Pocket Review: Pocket Print
\$30, Stevens Creek Software
800-823-4279
www.stevenscreek.com
Description: Allows you to print directly from a Palm to a printer with an infrared port

 Simple interface, good feedback, speedy response

 Can only print files from Memo or To Do list applications

vastly better system than the Newton's, which required you to draw complete, well-proportioned letters in the correct place on the line.

Palm's revised software for the Mac, the MacPac Version 2, offers many improvements over the original version. It places a full-featured organizer on your Mac that's based on

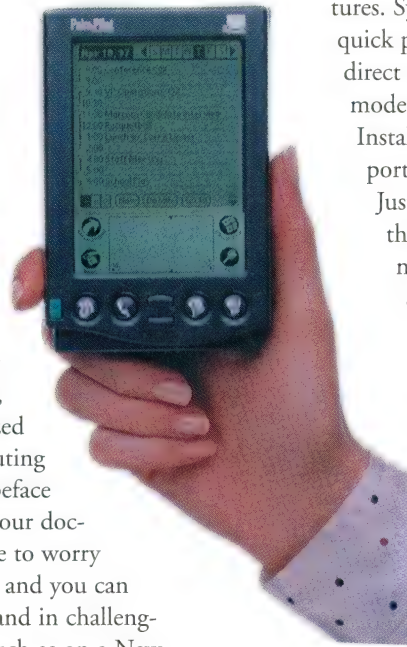
the venerable Claris Organizer, so it has a clean, colorful, and entirely Mac-like feel. Buttons are clearly labeled with pop-up text. The Synch Manager also resides on your Mac, and it's responsible for comparing, transferring, and over-

writing files. It has a friendly face and a useful set of features. Syncing is an easy, quick process using a direct serial or remote modem connection. The Install dialog box supports drag-and-drop: Just drop a file onto the window, and the next time you hit the Synch button on your Palm cradle, the file is installed. You can also click a button to call up a regular file-dialog box. One minor limitation is that you can only select one file at a time for installa-

tion. So if you're adding a suite of three programs, you have to issue three commands, which is a bit clunky.

It's Who You Know

The beauty of having your contacts in a Palm is that you can store thousands of them yet call one up in a second, using a speedy Find feature. When you get back to your Mac, you can synch up with Palm Desktop and manipulate the new data in any way you wish — copy it, paste it, or print it all out on label stickers. The Address application that comes



rating 

Pocket Review: GoType Keyboard
\$80, Landware
201-261-7944
www.landware.com
Description: Portable keyboard for the Palm

 Light, compact, stable

 Almost the same learning curve as Graffiti, and there's more to carry

with the Palm can handle all of this for you. Names are displayed alphabetically alongside the phone number, and a click on a name brings up a complete record, including e-mail addresses, fax numbers, and so on. Using the Palm's infrared port (available on all Palms but the Professional), you can beam your info to another's Palm, and zap — you're in their database.

How's About a Date?

The Datebook application that comes with the Palm is a simple but effective calendar in which you can jump from Day view to Month view with a click. You can also have it warn you, by means of its chirpy alarm, when it's time to leave for that next engagement. And if your Palm happens to be turned off, it will spring to life for the occasion. All of the information in Datebook synchs with Palm Desktop. It's a robust program, but there are many information managers out there, and many companies are releasing Conduits for the Palm. As an alternative, you may want to take a look at the \$40 Chronos Consultant, reviewed in *MacHome* in May, 1998.

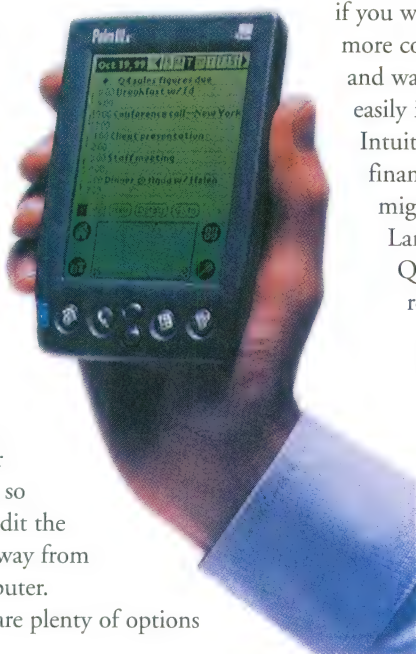
The Net in Your Back Pocket

All Palms contain a mail program for writing and replying to e-mail, and they're ready to be configured for Internet mail and Web browsing. But none contains Internet applications right out of the box. What they do supply you with is a Conduit that allows you to transfer mail that you've already downloaded from the Internet back and forth between your Mac and the pilot, so you can read and edit the mail off-line and away from your desktop computer. Fortunately, there are plenty of options

for Internet software out there, and many of them are free. Top Gun Postmaster, which is currently in beta but should be available by the time you read this, is an excellent tool for getting your e-mail. Just jack your Palm into any telephone jack using the Palm modem, dial into your ISP, and get your mail. Very handy indeed. ProxiWeb allows you to surf the Web on your Palm, complete with graphics, and HandWeb is a text-only Web browser, which is a much quicker and easier way of looking up information on the Web using a Palm. Top Gun and ProxiWeb are free, and HandWeb is \$50.

Keeping Tabs

The Expense application that comes with the Palm is a simple database, tailored to all things financial. It adds dollar signs to your numbers, when appropriate, and includes basic expense categories, such as Entertainment, Car Rental, and Office Supplies, which you can then edit to suit your fancy. It works well as a basic record-keeper, but if you want to perform some more complicated calculations and want something that will easily integrate into Quicken, Intuit's venerable personal finance application, then you might want to take a look at Landware's \$40 Pocket Quicken, which should be released by the time you read this. Designed in collaboration with Intuit, Pocket Quicken promises to be a sure-fire way to keep tabs on every one of your expenditures. With a few simple taps of the stylus, all is recorded — much like a piece



rating



Pocket Review:
Documents To Go
\$40, Dataviz
800-733-0030

www.dataviz.com

Description: Converts word processing files to Palm documents



Very fast, easy to use, Palm documents are neatly formatted, many formats supported



No ability to edit documents in the Palm

rating



Pocket Review: QuickPac
\$40, Landware
201-261-7944

www.landware.com

Description: A suite of programs for file management, text manipulation, scheduling, and drawing



Intuitive, powerful programs; drawing program contains Mac viewer; has bonus games



Programs are very different but must be purchased as one unit

of paper, but renewable, and much more powerful.


Words, Words, Words

The Memo Pad that comes with the Palm is your simple word processor. You can write notes in your Palm, transfer them to your Mac, edit them, and copy them back down to your Palm. But you can't export the tiny files to a real desktop word processor, so you have to copy the text from Palm Desktop to your word processor. Also, due to a 4,000-character limit in Memo Pad files, you have to copy each page of your Word document into a separate Memo Pad file.

If all you want to do is read a document on your Palm and have no interest in being able to edit it, Documents to Go, by DataViz, allows you to quickly and easily convert a word-processing file on your Mac into a document

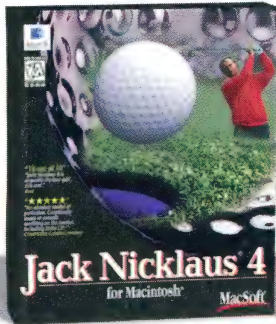
on your Palm, no matter what the length of the document. And it works with myriad file formats. I would, however, feel extremely frustrated with the product's no-edit limitation, so I would probably revert of the copy-paste method of document conversion, clumsy though it may be. But the next version of Documents to Go promises to add editing and the direct synching between Palm documents and Word documents. If DataViz makes this enhancement, Documents to Go will very much be the Way to Go for working with text.

The Handy Office

Pocket-sized computers can be a boon to your home office, and Palm Connected Organizers offer a sweet array of features for Mac users. With the release of the Conduit Developer Kit, we should be seeing these features growing and multiplying over the coming months. 

MacFunPack™

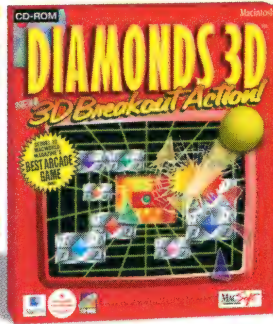
5 hit titles. 36 games.



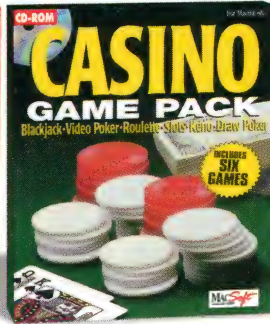
"...clearly a winner..."
Mac Home Journal



"Spiffy."
MacAddict



"Fun and addictive.
The best breakout game
I've played."
Inside Mac Games



"Delivers fun and
informative game play
in a big way."
Mac Home Journal



"4 out of 5 apples"
Mac Home Journal

One box.



\$19⁹⁵

Totally Mac. Totally fun!



Available soon at your favorite retailer,
or visit the GT online store: www.gtstore.com

Jack Nicklaus 4 is a registered trademark of Golden Bear International. Accolade is a trademark of Accolade, Inc. Produced in association with Jack Nicklaus Productions, Inc. Developed by Eclipse Entertainment. ©1997 Accolade, Inc. Published and distributed by MacSoft, an affiliate of GT Interactive Software Corp. All other trademarks are the property of their respective owners.

MacSoft®
An affiliate of GT Interactive Software
www.wizardworks.com/macsoft/

When You're a Jet You're a Jet

The DeskJet 882C vs. the Stylus Photo 750

Color inkjets should come packaged with black berets, for such printers have the power to transform the home dilettante into the veritable home *artiste*. Inkjets provide vivid, realistic color that will grace not only your digital photographs, but also your creations from any graphics application, from Photoshop, to Painter, to Bryce.

The drop shadows that laser printers render as a polka-dot pattern look like real shadows when printed by an inkjet. Newer inkjets produce color blends that are subtle and gradual, but some models are better at it than others. *MacHome* looked at two color inkjets for \$299, Hewlett-Packard's DeskJet 882C and Epson's Stylus Photo 750. Which one will best help you to give vent to your creative urges?

The Basics

Hewlett-Packard's laser printers have always been known for their Mac friendliness. Not so with its inkjets. The DeskJet 697C, reviewed in *MacHome* in January 1999, was "Mac-compatible" only if you used a third-party cable for converting the printer's parallel port to USB, so that the printer could be used with an iMac or a blue-and-white G3. HP's 882C, however, is equipped with native USB, and Hewlett-Packard has developed its own Mac driver. This is a vast improvement over using a third-party solution, but this printer could stand to be a bit friendlier to Macs. If you looked at the box, you wouldn't know it was a Mac printer, and you need

to download the Mac driver from the Web (www.hp.com/go/mac-connect). And, of course, when you open up the box, you're greeted only by Windows user manuals and quick-start setup guides.

The 882C comes in a sturdy case with rakish, wavy sides that inspired interest and admiration in some of us here in the office and a confused scratch of the head in others. You add paper to a thick, smoothly molded input tray that you access by means of large levers that slide intuitively and reassuringly, reminiscent of Fisher-Price toddler toys, and just about as easy to use. It can accommodate up to legal-sized paper, as well as envelopes and other small formats, and it can handle continuous-feed paper for banners and panoramas.

The Epson Stylus Photo 750 replaces the much-lauded Stylus Photo 700 (reviewed in *MacHome* in August 1998), and it's both sharper looking and faster than its predecessor. As the name implies, the printer is ideal for photos. It uses six colors, adding light cyan and

light magenta to the usual quartet of cyan, magenta, yellow, and black. It comes in the same outer shell as the 700, but it's a cool black instead of the usual off-white. You load the paper vertically into the back of the printer, and your prints emerge in a tray at the bottom. Both input and output trays can be telescoped out to accommodate legal-



sized paper. These same trays can be folded up, or in the case of the input tray, removed, to free up some space when you're not using the printer. The Photo 750 can also accommodate continuous-feed paper.

The Looks

Although the DeskJet 882C does an admirable job printing photos, its photos come out looking much coarser than those from the Epson Stylus 750. With

the DeskJet, the actual dots of the printer are easy to see from about a foot away, whereas with the Stylus, I had to look much more closely to see them. Similarly, the Stylus provides a richer variety of colors, which helped to contribute to an overall superiority of contrast in photographic output. Both showed extremely accurate color-matching — flesh tones were appropriately rendered, green trees didn't come out purple, and the sky was always blue.

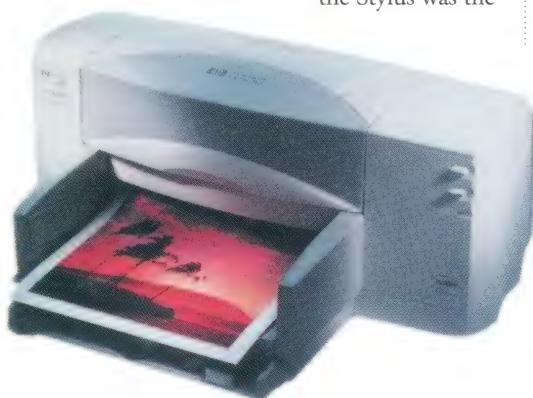
However, in terms of printing text, the DeskJet prevailed. In fact, at the settings for its highest quality, it produced probably the smoothest text from Microsoft Word that I've ever seen on an inkjet — sharp as a laser, in fact. At the Epson's highest settings, text looked quite good, but you could still perceive some jagged edges. At settings for lower quality, the output from both printers looked about the same: serviceable, but not nearly laser quality.

Because neither printer is PostScript capable, both had their strong points and weak points in dealing with QuarkXPress, a heavily PostScript-dependent desktop-publishing application. The DeskJet showed exceptional color matching in Quark, without my having to tweak its controls in the slightest, whereas no matter how I attempted to tweak the color, a purple object in Quark persisted in printing out brown on the Stylus. Also, when using Quark, the DeskJet demonstrated the same stellar text quality that it did with Word. But in printing gradients created in Quark, a very difficult feat for a non-PostScript printer, the DeskJet flopped, reproducing the gradients in blocky squares, whereas the Stylus printed out these gradients with ease.

The Speeds

Inkjets are not the speediest of printers. That's especially true of "photo" inkjets, which are made to provide the best possible output at the expense of a little speed, and both of these printers fall into that category. However, these babies are slowly catching up to those colorful speed-demons, the color lasers. These are both

substantially faster than Epson's earlier photo printer, the 700. Overall, the DeskJet came in a little faster than the Stylus, but not by a huge margin. In a test printing of a 13MB, 300dpi Photoshop file, for example, the DeskJet took five and a half minutes and the Stylus took six. Though this is but a minuscule discrepancy, I found it to be true across many different tests, except for those using Quark, in which the Stylus was the



one to come in ahead. Using economy

mode and the fastest settings, both produced pages from Microsoft Word in about 30 seconds per page. Both printers' text was a bit rough in that mode, but it was certainly adequate for memos and rough drafts; you won't want to print out resumes at this speed, though. For high-quality text, it took about three minutes per page on each printer — much slower than lasers, which can do the job in under 10 seconds, even at their highest settings.


The Costs

For both printers, you need two cartridges: One for color ink, and one for black. The DeskJet's black cartridges cost about \$29 and yield around 840 prints at 5% coverage of the page, according to HP's estimates. Color cartridges run about \$30 and yield approximately 422 prints. This comes to a price per print of around 10 cents, not counting the paper, which is not a bad cost. Inkjet paper costs around 10 cents per sheet, and Hewlett-Packard photo paper, which is recommended for the best results, costs about 67 cents per sheet.


The Epson 750's costs are a bit higher: Black cartridges cost around \$25 and


have an expected yield of 378 prints, and color cartridges cost about \$20, and are expected to yield about 220 prints. This brings the 750's cost per print to about 16 cents, not counting paper. Epson inkjet paper also costs around 10 cents per sheet, and Epson photo paper costs around 45 cents per sheet. Both printers allow you to print on regular bond paper, which costs considerably less, and it doesn't matter what brand you buy. For the special paper — the inkjet and photo paper — it very much matters what brand you buy. Although you might be able to get away with it, often when you use the wrong kind of photo paper in an inkjet, you not only get sub-optimal output, your page could end up a blotchy monstrosity.


The Final Decision If you want better photographic output and Mac-friendly manuals, go for the Epson Stylus Color 750. HP's DeskJet 882C might be a better option for those who want to print text-heavy documents from applications such as QuarkXPress; though the photos will be noticeably coarser, the colors will be truer and the text will be sharper. But remember that the DeskJet can't handle gradients created in Quark, so you'll need to create such effects in other programs and import them. **MH**

rating 

DeskJet 882C
\$299, Hewlett-Packard
800-752-0900
www.hp.com
USB Required

 Excellent results with PostScript applications, a bit faster, less expensive per-print costs

 Coarse photo output, no Mac documentation in box

iMac/G3 Compatible


rating 

Stylus Photo 750
\$299, Epson
800-463-7766
www.epson.com
USB Required

 Brilliant, bright, smooth, photographic output

 A bit more expensive per print, color-matching problems in QuarkXPress

iMac/G3 Compatible


Roland Super MPU64 MIDI Interface

The shift to USB left many a MIDI enthusiast feeling left out, as numerous USB peripherals were announced in the wake of the iMac, but MIDI devices remained a distant promise. Thankfully, Roland is out of the gate with this interface, bringing the promise of adapter-free MIDI to the USB crowd.

Setting up the interface with USB turned out to be confusing, because OMS (Open Music System), which allows MIDI to work with the Mac, searches the printer and modem ports for attached MIDI devices. Of course, neither the iMac nor the new G3 have printer or modem ports, so we were unsure that the interface would show up in OMS's setup window.

But show up it did, and work it did.

We played back and created MIDI files to good effect and found that all the normal MIDI parameters work correctly. The first time we tried we got some stuck notes (notes that started but wouldn't stop), but Roland sent us new



driver software that alleviated this problem. Interestingly, Roland calls for 64MB of memory (none of it virtual) for correct operation, yet we were able to use the interface successfully on a first-generation iMac with the stock 32MB of RAM.

The Super MPU64 gives you four MIDI ports, with one in and one out for each. Once the setup was complete, it was very easy to assign the ports, which is handy if you have multiple MIDI modules or keyboards in your

setup. With ours — using just one keyboard controller and MIDI module — we only needed one set of ports, but it's good that this unit can handle a large setup if needed.

The Final Decision One area we hope Roland will improve is the owner's manual — it's very Windows-centric. In fact, the box and the manual only list Wintel systems in the system requirements. This wasn't too much of a problem, but we hope the Mac will warrant a space in the manual some day.

— John Poultnery

rating	iMac/G3 Compatible
\$250, Roland Corp. 800-3870-2580 www.rolandcorp.com USB Required	
Well-automated setup, 4-port design capable of handling large MIDI networks	
Windows-centric installation instructions and manual	

DreamWeaver 2

Macromedia and Adobe are in a heated race to take control of the latest publishing paradigm, the Web. Adobe recently purchased the powerful GoLive CyberStudio, and now Macromedia has released the second version of the equally powerful DreamWeaver.

Initially, DreamWeaver sported some powerful, unique features, chief of which was Roundtrip HTML, which allows you to edit your Web page in HTML and immediately see it updated in the background as you work. Unlike other HTML-editing tools, such as those in Adobe's PageMill, this doesn't hose your original code.

DreamWeaver now includes many CyberStudio-like features. It gives you a

Site Window, from which you can get an overview of all of the pages in your site; a Property Inspector, which lets you view pertinent information about images, objects, and text; and Point-to-File, which lets you create page links by dragging between the Property Inspector



and Site Window.

DreamWeaver even gives you floating palettes, which you can combine into single, multi-tabbed palettes.

You can also create pages using Layers,

which gives you pinpoint accuracy when placing objects. Also, the program allows you to view all manner of media — even QuickTime, ShockWave, and Flash movies — without having to toggle between applications.

DreamWeaver still has a tremendous learning curve and therefore is not a

product for the faint of heart. And the programmers have made some odd design decisions. For example, creating a new site requires you to select New Site... from the Site menu rather than from the File menu, as you'd expect.

The Final Decision Hefty learning curve and design quirks aside, DreamWeaver is poised to pose a strong challenge to Adobe GoLive. And if you're a professional who's sensitive to the way your hand-coded HTML is manipulated, you'll be hard-pressed to find any program on the market that can stand toe to toe with DreamWeaver.

— Jeff Battersby

rating	iMac/G3 Compatible
\$290, Macromedia 800-457-1774 www.macromedia.com PowerPC Required	
Near-perfect HTML imports, improved drag-and-drop design features	
User-interface remains tough to negotiate, steep learning curve	

Keyspan USB-to-Serial Adapter

If your older digital cameras, graphics tablets, inkjet printers, modems, and PDAs seem orphaned as a result of the arrival of the iMac and new Power Mac G3s, don't despair. Keyspan has come to the rescue.

Keyspan's USB-to-Serial Adapter lets you hook up those old devices with virtually undiminished performance. The adapter has two serial ports at one end and a USB plug on the other. It's easy to set up: Just install the software, restart, and plug everything in.

If you're using a serial modem, you have to make sure to use Port #2 and select it in your Modem Control Panel or Internet service software (it's identified as "Key USB0 P#2"), but once that's done, it should work just fine. For



printers (which need to be in Port #1), you may also have to run the USB Serial Assistant Control Panel for the printer's driver to recognize the new port.

Through days of Net surfing on my blue-and-white G3, the Keyspan adapter didn't miss a beat. I tried it with modems from U.S. Robotics and Zoom, and connected to AOL, CompuServe, and my ISP. Its performance equalled that of the ports of my older Power Mac.

Unfortunately, the adapter didn't work with my Epson 850. The only Epson printers recognized at present are the older 300 and 500 series. And there are other limits to the adapter's magic. LocalTalk printers won't work, nor will the Apple Geoport, a special kind of modem that works on older Macs. Also, if you want to bring music into your iMac or blue-and-white G3, you're out of luck — the adapter

won't support MIDI. However, Keyspan says it will soon release a hardware revision to add for support Apple StyleWriter and Epson printers and probably MIDI, (but not LocalTalk). So, it's a good idea to visit Keyspan's Website and consult the list of supported products before buying.

The Final Decision You don't have to toss your old serial devices into the trash if you add an iMac or blue-and-white G3 to your home or business. If the device is on the list of supported products, Keyspan's USB-to-Serial Adapter will provide the means to their salvation.

— Gene Steinberg

rating

\$79, Keyspan
510-222-0131
www.keyspan.com
USB Required

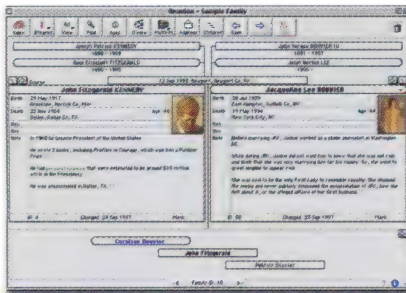
Fast setup, works great with modems and many serial devices

Some serial printers, Geoport, LocalTalk printers, and MIDI are not supported

Reunion 6

Reunion has long been rated the best genealogy product available for the Mac. Its slick interface and ease of use make it perfect for family-tree newbies and serious genealogists alike. And Reunion 6 is a compelling upgrade, making it the perfect way to research your roots.

Building a family history in Reunion is elementary. Upon creating a new database, you're asked whether you want to add a new person or import an existing data file. (These steps can be skipped if you just want to play around at first.) Once you've added your first record, you're well on your way. The program provides several means — all of which are incredibly intuitive — of adding parents,



siblings, children, new or multiple spouses, and virtually any other possible family variant. Within a matter of moments, and even with a very limited amount of information, you can create a clearly defined lineage. Reunion also includes excellent help and tutorial files. If any feature isn't immediately obvious, you'll be able to figure it out in a snap.

Reunion 6 adds a bevy of new features, as well as updating or enhancing many standard ones. You can now add pictures to the Main Family Card View, allowing you to look at old Aunt Jane while you're entering detailed information about her. There is now a Match-and-Merge feature that will search your database for duplicate records and allow you to delete or correct them. The program also provides Privacy Filtering, so you can omit specific personal information that may not be suitable for public consumption.

What makes Reunion a complete standout are its reporting tools. Not only can you easily print out a standard genealogy chart, but your complete database can be ported to HTML so that you can pop it onto the Web for others to see. You can also print out blank Person or Family pages that can be used for collecting information about your family.

The Final Decision Reunion is the best genealogy software on the market for a good reason. Ease of use, intuitive interface, and excellent reporting tools make Reunion the only program you'll need to trace your family history.

— Jeff Battersby

rating

\$100, Leister Productions
717-697-1378
www.leisterpro.com

Intuitive interface, excellent help and tutorial, perfectly suited for beginners and professionals

None

USB Floppy Drive

What to do with all those floppies lying around? Owners of iMacs and new G3s are forced to confront this conundrum, even though they have the slickest computers on the planet. So it's only natural that VST, makers of PowerBook gear and other peripherals, would produce a USB floppy drive. Like the iMac and the blue-and-white G3's, VST's floppy drive is encased in translucent blue-and-white plastic. It has an in-use light, a manual eject button, a jack for the USB cord, and that's it — no AC adapter is required.

It won't read the very old 800K floppies, so if those are the kind that are clogging your shoe boxes, this drive won't do it for you. But this limitation also holds true for the Imation and Winstation SuperDisk drives, though those drives can read 120MB SuperDisks in addition to floppies. The VST drive is less expensive than a SuperDisk drive, and it's a little bit faster. Using both the Imation and

Winstation models, we got an average data transfer rate of 800K per second, whereas the USB floppy drive transferred data at a 980K per second clip — about 20% faster. We wouldn't call either type of drive sprightly, but they're limited by the floppy architecture. You can only spin a floppy disk so fast. However, the VST drive doesn't have power-eject, so when you eject disks, they don't just pop out as they would with a traditional floppy drive. Instead, a message appears on the screen that says, "You can now eject the disk," whereupon you have to click OK and then manually eject the disk — an irksome feature. I did learn, however, through trial and error, that you don't have to click OK; you can manually eject the disk, and the message will disappear. But with truly user-friendly



devices, you don't find yourself doing much by trial and error.

The Final Decision For only a hundred bucks, the VST USB Floppy Drive might be a good way to gain access to the data in those long-forgotten floppies (as long as they're not too old), but for about \$50 more, you can get a SuperDisk drive, which can move your data much more quickly and can also read 120MB disks.

— David Weiss

rating

\$100, VST Technologies
978-635-8200
www.vsttech.com
USB Required

Cool design, requires no AC adapter

must manually eject disks, can't read 800K floppies

iMac/G3 Compatible

PhoneWatcher

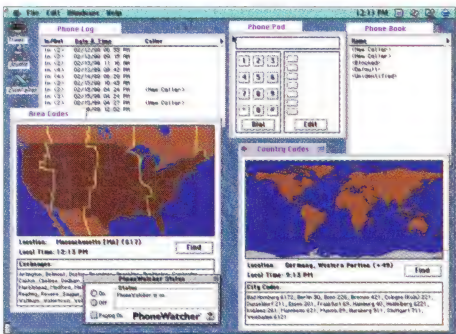
First impressions can be way off. Mine was that PhoneWatcher was a one-trick pony — get a phone call, and it'll dial your pager. Sure, it can also dial out from your Mac and maintain a log of all your calls, but so does Claris Organizer. So what's the big deal with PhoneWatcher? If you purchase Caller ID from your local telephone company (it's \$7 a month for me) and your modem recognizes caller ID information, you can use PhoneWatcher to block selected calls, keep a much more detailed log than you can with Organizer, and send messages to your cell phone to announce missed calls — in which case it will also include the caller's number.

PhoneWatcher is also scriptable. So with a little FileMaker Pro development know-how, you can have PhoneWatcher query a database and pull up info based on the caller's ID. You can also hook PhoneWatcher to your stereo so that it loudly announces incoming calls and have it can blink the menu bar as well — which could be useful for those with hearing impairments. However, the interface can be a bit awkward. The note area for logging incoming calls is much too small. And caller information doesn't just pop up on the screen; PhoneWatcher enters all incoming calls in a log, and you have to double-click each entry in order to view it. And to have PhoneWatcher announce a caller by name, you have to enter the name into a

special table alongside the number. You also have to make a few modifications in an AppleScript, and this is not explained in the 2.0 manual.

The Final Decision If you're plagued with crank calls, need to be paged immediately when you miss a call, need call logging and speed dialing for your business or home, or need to have someone yell loudly that a call is coming in, PhoneWatcher is for you. But, if you don't want to mess with AppleScripts or expect an easily accessible record of phone conversations, you'll need to wait for a later version.

— Thom Cannell



rating

\$80, Mark/Space Softworks
800-799-1718
www.markspace.com

Tons of features, scriptable, takes up little disk space

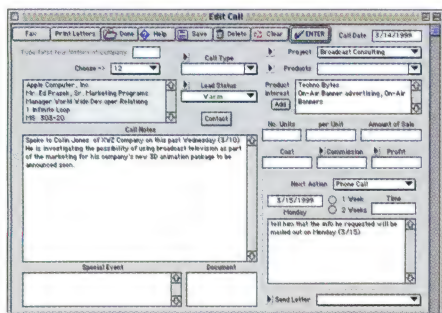
Useful only with caller ID and caller ID modem, slightly awkward interface, requires some scripting

Territory Manager 3.0

Now keeping your sales activity organized — from cold calls and presentations to the follow-up after the sale — is a cinch. Territory Manager 3.0 is one of the easiest-to-use products of its kind that I have seen on any platform.

It's easy to build a contact list: Just select Contacts from the menu and start typing them in. Market Master 4.0, in con-

trast, forces you to establish a number of strategy steps before you can really use the program. Also, Territory Manager 3.0 allows you to easily import your contacts from any application on any platform that can export data files as tab-delimited ASCII text.



Territory Manager helps you to track sales by company, product, zip code, or any other category you wish, using customizable data fields. You can attach sales proposals, letters, or any kind of document to a sales contact record, and Territory Manager will keep track of them. You can then launch the attachment from within Territory Manager. It's also very flexible in meeting your organizational and management needs. You can edit key tracking categories, such as Lead Status, Lead Source, and others, depending on how

you need to use them. The program provides you with twelve (wow!) user-definable fields for further tracking. There's no need to worry about data disappearing come the year 2000, because Territory Manager uses four digits for the year (while the Mac OS is

Y2K compliant, some applications may not be).

My only complaint about the program is that at \$395, few people will be able to buy it. But with a competitive upgrade price of only \$149, it appears that Software Solutions is out to convert the competition.

The Final Decision Whether you are selling widgets from your garage or you have a large account list or territory to manage, you will love this program. Territory Manager 3.0 will be one of the first programs I install on my PowerBook G3. That is, when I can afford one.

— Art Jones

rating
\$395, Software Solutions 812-477-3181 www.macapp.com PowerPC Required
Easy to use, very customizable
Expensive

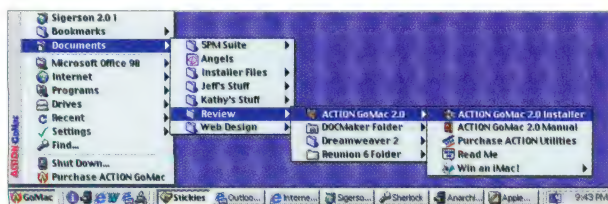
Action GoMac

At first blush, Action GoMac appears to be built on a foundation of Windows envy; it places a task bar — a la Windows 95/98 — at the bottom of your Mac's desktop. Au contraire, GoMac is where the envy begins, and it's Windows users who'll soon be turning green.

GoMac is a combination System Extension and Control Panel. Like its Windows second cousin, GoMac displays currently open programs and lets you bring them to the front with a single click. It also includes a Start Menu from which you can access programs, recent documents, Control Panels, and the Extensions Manager. But that's where the similarity ends. The System Tray, which appears on the right-hand side of the bar, can be customized to contain any number of Control Strip modules, and it can display a user-selected set of active applications. Click the

time portion of the System Tray, and up pops a full calendar, highlighting the current date, which can then be navigated to locate any date.

You can drop any application or doc-



ument icon onto the Start Menu and have it appear in the menu for easy access, but GoMac far outclasses the Windows task bar with its QuickLaunch feature. Add an alias to the QuickLaunch Items folder, and you can open the item with one click without ever having to search your hard drive.

GoMac does beg a couple of questions. First, why does the Mac need a bar tacked to the bottom of the screen — unlike with Windows, you're unable to move it anywhere else on the desktop — when the Apple Menu already serves

the same purpose? Why give up extra screen space to display information that's easily accessible from your Mac's application menu — which, with Mac OS 8.5, can now be torn off and placed anywhere you please? And why use a Start Menu to access a Shut Down function? The obvious answers? Because Windows does.

The Final Decision GoMac perfectly replicates the Windows Task Bar and adds features that make GoMac clearly superior. It'll take up some real estate and give you a Windowsy feel, but if you're searching for interesting ways to get more out of your Mac, Action GoMac is certain to satisfy your needs.

— Jeff Battersby

rating
\$40, PowerOn Software 800-344-9160 www.poweronsw.com
Many useful features, far outsmarts the Windows Task Bar
Makes Mac OS more Windows-like, reduces screen real estate if auto-hide feature is turned off

HL-1050 Laser Printer

Fast? You want a laser printer that's fast? Take a look at the HL-1050 from Brother. It's also one of the least-expensive options available.

The HL-1050 has a compact design — the output tray folds back into the body of the unit, to conserve space. Also, it has two input trays — one for a stack of up to 250 sheets of paper and one for manually feeding individual sheets — and the manual-feed tray closes over the cassette tray, again conserving space. It has four lights on the front, which indicate the status of the drum, toner, and paper.

It's essentially a Windows USB printer, made adaptable to the Mac platform by means of an Infowave driver designed



specifically for Brother. One of the limitations of this arrangement is that with any third-party driver, the HL-1050 can only produce 600 dpi output, rather than the 1,200 dpi it's capable of. That's because the code required to coax the higher resolution out of the HL-1050 lies with Brother, and it has decided, for the time being, not to share it. But as I said, the printer is fast. In fact, it's faster at printing text than HP's 2100TN — which costs just shy of a thousand dollars — and

with 10- to 14-point text, you can't really tell the difference between 600 dpi and 1,200 dpi. Unfortunately, printing text is this printer's only big strength. Photographs, graphics, and blends come out looking very coarse — even compared with other 600-dpi printers. When printing from QuarkXPress, it completely freaks out, blowing up every-

thing to much larger than its intended size before it switches all text to 12-point Courier, mottles the page with black squares, and crashes the machine. However, this problem will no doubt be solved very soon, because it doesn't occur using another of Infowave's drivers for the Mac (see PowerPrint USB review).

The Final Decision If you need to crank out letters and memos, the HL-1050 is probably your fastest and least expensive option. But if you're looking for a printer to be your all-around workhorse, you might want to invest in one that's a bit more on the higher end.

— David Weiss

PowerPrint USB

For years you've been using Wintel computers, but when the iMac came along, you couldn't resist it. Now your Compaq is gathering dust, and you're ready to haul it down to the Salvation Army. But wait: Before you pack your printer up, Infowave would like to tell you something: You can still use your Windows printer with your iMac by means of Infowave's PowerPrint USB, a Parallel-to-USB conversion cable that ships with myriad drivers.

Setting up a Windows printer is incredibly easy. Just load up the drivers, plug in the cable, start up the iMac, and select the printer in the Chooser just as you would any Mac printer. With the drivers provided, you can theoretically print to more than 1,500 printers.



I tested out PowerPrint USB using Brother's HL-1050 (see above), and compared the printer's performance to how it did with the Infowave driver that was designed for it.

Using PowerPrint USB, I had to use the LaserWriter 4 driver, because the Brother driver was not yet available on the PowerPrint USB disc. Infowave tech support told me that this would be the best driver for the Brother printer. This confused me, because it says on the PowerPrint USB package that it supports Brother printers, and yet I couldn't find a Brother driver on the list when I installed them. If I hadn't called tech support, I wouldn't have known this.

I think it would have been better if they'd copied the LaserWriter 4 driver and renamed it "Generic Brother Driver," because it worked fine. In fact, using the LaserWriter 4 driver, I was able to work

with QuarkXPress documents just fine, and I got some spiffy performance: The Brother cranked out an eight-page document, replete with fonts, photos, and graphics, in a little over 2 1/2 minutes. The only printer that was able to beat this speed was HP's \$999 2100TN. That didn't help the print quality, though.

The Final Decision If you have a USB-enabled Mac and a Windows printer glaring at each other from opposite sides of the room, never fear. They can speak to each other using PowerPrint USB. And they might just get along fine.

— David Weiss

rating

\$400 (+ \$39 for Mac driver), Brother
800-284-4329
www.brother.com
USB Required

Fast, inexpensive, compact design

Macs limited to 600 dpi, coarse gradients, jaggy text for a laser

iMac/G3 Compatible
USB

rating

\$99, Infowave
800-663-6222
www.infowave.com
USB Required

Connect to over 1,500 parallel (Windows) printers, fast performance, easy to use

Not entirely clear which printers it supports

iMac/G3 Compatible
USB

Special limited time offer for MacHome subscribers.
SEE ENCLOSED SOFTWARE OR CALL TODAY!

How Mac friendly is EarthLink?



How about 15 free days and free setup (save \$35)!*

Thousands are choosing EarthLink™ Sprint® over other ISPs everyday. Here's why:

- Unlimited Internet access at speeds up to 56K
- More local access numbers nationwide than any other ISP
- Fast, reliable email
- Personal Start PageSM
- Free 6MB Web site
- Toll-free 24-hour help
- New user's guide and member magazine
- Free month of access for every friend you refer
- And much more!

"EarthLink has become the Macintosh of the ISP world — the way for 'mere mortals' to connect to the Net." [Business Week]

"The largest independent Internet service provider is also one that caters well to its loyal Macintosh subscribers." [Mac Central]

Call today!

1-888-EARTHLINK Ext #3940

3 2 7 - 8 4 5 4



EarthLink™



* Monthly rate is \$19.95 thereafter

©1999 EarthLink Network, Inc. and Sprint Communications Company LP. Trademarks are property of their respective owners. Sprint and the Sprint logo are trademarks of Sprint Communications Company LP. EarthLink, EarthLink TotalAccess, and the EarthLink logo are trademarks of EarthLink Network, Inc. All Rights Reserved.

Lime-Green iMac 266MHz

The Emperor's New Clothes? **By** John Poultney

The iMac: sophisticated computer or interior design accessory? Apple wisely says “both,” and a spin with one of the new 266MHz models, introduced at January’s Macworld Expo, will likely convince you they’re right.

Yeah, yeah, yeah — the new iMacs come in five colors. Lime, Strawberry, Grape, Tangerine, and Blueberry. We checked out a lime-colored version, but we have to assume that in terms of performance, it’s very similar to the other colors.

We observed no major differences from earlier, pre-USB G3s when using the machine for word-processing, Web-surfing, and graphics work, though the smallish design of the iMac keyboard contributed to quite a few typos. Additionally, the round mouse proved hard to handle at times, as it would occasionally send the cursor flying diagonally across the screen instead of in the intended direction. Both of these foibles were observed in the original iMac as well. Luckily several full-size USB keyboard and mouse alternatives are available from such manufacturers as MacAlly, Contour Designs, and Anir; we’d recommend checking these out if the iMac’s included peripherals don’t float your boat.

Aside from the faster processor (266MHz in the new systems, 233MHz in the originals), the innards of this machine differ a little from the earlier iMacs. There’s no infrared port; Apple said that was discontinued because most users opted to connect via the USB bus. There have also been some changes to the logic board, so the few expansion cards (Griffin’s iPort, MicroConversions’ Voodoo2, Formac’s SCSI-3 card) that were made for the original iMac won’t work in the new one, at least not until the manufacturers develop new designs.

For most regular-Joe usage we didn’t

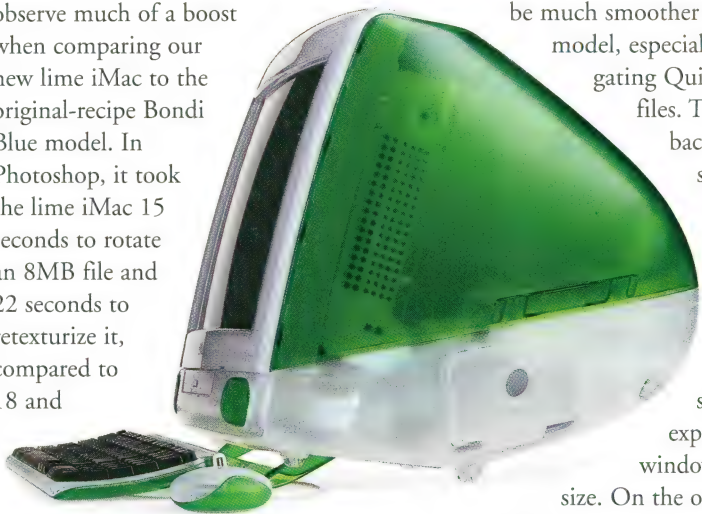
observe much of a boost when comparing our new lime iMac to the original-recipe Bondi Blue model. In Photoshop, it took the lime iMac 15 seconds to rotate an 8MB file and 22 seconds to retexture it, compared to 18 and 29 seconds on the old one. Using Terran Interactive’s Media Cleaner Pro 3.0 to crop and compress a five-minute QuickTime video took 28 minutes on the new iMac, and 30 minutes on the old one — nothing to wake the kids about.


Opening applications is a little faster with the new system, but again, not by much. Word 98 took eight seconds to open on the new system, compared to 11 on the old. Media Cleaner Pro and Quark XPress didn’t see much acceleration, taking six and 15 seconds, respectively, on the new system, and seven and 16 seconds on the original iMac.

Video performance — now that’s another story. As the new iMacs include 6MB of video RAM, compared to 2MB on the original model, you’d expect a pretty significant difference, and you’d be right. Also, the new machines use the ATI Rage Pro Turbo graphics controller;


the originals used ATI’s slower Rage IIc design. Norton Utilities’ System Info testing utility gave the new iMac a score of 599 in the video arena and a score of 536 to the old iMac. Just looking at numbers doesn’t tell the whole story, of course — we found video playback to be much smoother on the new model, especially when navigating QuickTime VR files. These played back very smoothly on the new machine, even when we rotated quickly within the scene or expanded the window to double size. On the older system, the playback became comparatively herky-jerky with these files, especially when the image size was doubled.


The Final Decision The new iMacs aren’t the fastest Macs by a long shot, nor are they the most expandable, but they do a nice job with most tasks and are quite adept at handling video. Though you can get a much faster and more versatile setup with a new G3 tower system, the well-integrated design and integrated monitor and modem make this computer a very good buy. Not to mention a snazzy little piece of modern art. **VIII**



rating 

iMac 266MHz, pick a color, any color
\$1,199, Apple Computer
800-538-9696
www.apple.com

 Nice design, fast video performance

 Not as expandable as original design

Talk to Us!

(You could win big...)

Readers, we need your help.

Each year we rely on you to tell us about yourself and your computing experience: who you are, what you use, what you'd like to know more about.

We use this information to develop the perfect magazine for you, and we also pass the information on to software and hardware companies so that they, too, can develop products for you!

Please go to

www.machome.com/ninetynine.html

and take a few minutes to fill out our survey.

You'll automatically be entered to win software, hardware, and other great prizes!

Thank you,

Susan Ford
Publisher

Set Your Sites on Music

Top Internet Picks for Music-Making Information, Advice, Equipment, Education, and Fun

If you're a musician — or hoping to become one — the Web is a dangerous place. It offers so many helpful resources that you may spend all your time clicking links instead of playing! Fortunately, your Mac was wired for sound.

Download and install a few plug-ins such as QuickTime (www.apple.com/quicktime) and Shockwave (www.macromedia.com/shockwave), and you'll be able to hear and make music online as well as read about it. Later on in this musical tour, we'll even cover an ingenious free service that lets you collaborate with other modem-packing musicians to create songs in real time.

Any Portal in a Strum

Remember just two words from this article and you'll enjoy many happy hours online: Harmony Central. This massive yet easily navigable site (www.harmony-central.com) is a great entry point to the Internet's vast musical assets. There are daily news updates, lively discussion forums, and links galore. Another good springboard is the aptly named Music Resource Site (www.jps.net/mrs), which sports a goodly collection of links and a strong Mac focus.

If you have a synthesizer or are looking to get one, you'll love Synth Zone (www.synthzone.com). Its well-organized tables make it easy to access manufacturer and support pages for anything that makes sound electronically — and that includes your computer. Some of today's most intriguing sounds are coming from

synthesizers that run entirely in software, and Synth Zone's Soft Synths page will point you to them.

Opinions matter to me when I'm looking for new musical gear. Before I buy anything big these days, I look it up on Deja News (www.dejanews.com) to see what other musicians are saying. It's a searchable directory of messages posted in over 80,000 online discussion forums (also known as newsgroups).

You may wish that musical information could come directly to you, instead of you having to search for it. Subscribe to a mailing list and it'll, showing up in your e-mail box daily or weekly. (You may want to create a second e-mail account so your other messages don't get lost in the deluge.) The UCSD Listserv Page (<http://orpheus.ucsd.edu/music/lists.html>) can direct you to music-oriented mailing lists. Search at Liszt, the mailing list directory (www.liszt.com), for even more.

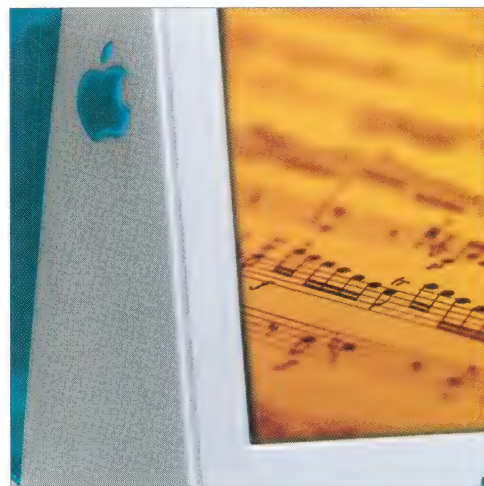
References, Please

Surprisingly, some of the deepest music Websites are run by paper magazines. At MusicMagazines.com (just slap a "www." in front of that), you can link to more than 300 of them. The detailed editorial profiles and subscription information

may help your "acoustic" mailbox to see some action, too.

What's Apple doing in music? Visit its Design & Publishing Music Page (www.apple.com/publishing/music) to find out. For a hard-core analysis of the Mac's musical innards, see <http://developer.apple.com/techpubs/quicktime/qtd evdocs/RM/sndframe.htm>.

An excellent glossary of music technology and recording terms awaits you at the Sweetwater InSync Daily site (<http://insync.sweetwater.com/wftd>). Sweetwater is a musical instrument



retailer, so the main InSync page spouts some sales hype, but its profiles of new equipment are quite informative. The Technical Tip of the Day link is always enlightening, too.

Gear Here

Speaking of gearing up (and what musi-

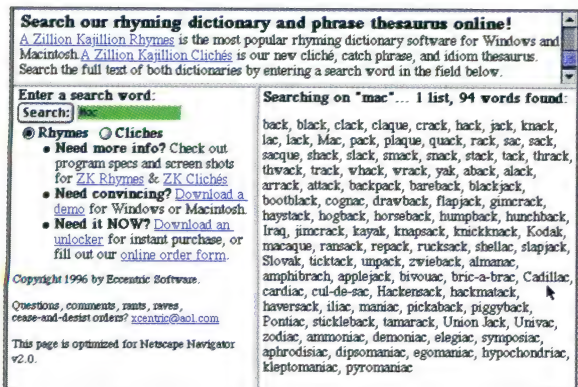


Figure 1 Zillion Rhymes Songwriter's block is a thing of the past with Eccentric Software's automated rhyming dictionary.

empty handed. Just try. For music programs hatched from the warped minds of academics, drop by Tom Erbe's Mac Music Page (<http://shoko.calarts.edu/~tre/CompMusMac>) or the Studio for Electro-Instrumental Music (www.xs4all.nl/~steim/main.html).

MIT's Info-Mac HyperArchive also has a wealth of sonic goodies. Punch up <http://hyperar>

chive.lcs.mit.edu/HyperArchive/SearchForm.html and search for audio, MIDI, or music.

Sounds and Samples

Whether you're assembling giant grooves by layering multiple sound files in a program such as AudioFusion TWS (www.audiofusion.com) or just looking to spice up your error beep, you'll find boatloads of sounds on the Web. Start at Harmony Central's Sites with Patches and Samples page (www.harmony-central.com/Synth/#pat). Free drum loops and musical riffs abound at SampleNet (www.futurenet.com/samplenet). And all-purpose Mac sounds are the name of the game at Clixsounds (www.clixsounds.com/sounds).

Professionals will dig the Hollywood-quality sound effects at Sound Dogs (www.sounddogs.com), which can be previewed online and bought individually. (Professional CD sound libraries typically cost well over \$100 per disc.) Gargantuan sound developer East-West also sells its sounds online; you can even search for rhythm loops by tempo. (See www.eastwestsounds.com.)

Songwriting

Got your gear, your software, and your sounds? Time to write a song. ProMusicFind's Songwriting Resources page (www.promusicfind.com/songwrite.html) will get you off to a good start. If you're stuck for words, check out the online rhyming dictionaries at www.eccentricsoftware.com/ZKDDemo.html and www.link.cs.cmu.edu/doughb/rhyme-doc.html. (See Figure 1.)

arian isn't?), GearSearch.com offers links to scads of musical instrument retailers and catalogs. If you're looking to save some money, hit the Used Music Gear button (www.usedmusicgear.com). This outfit is actually a broker — the seller sends them his instrument, you send them your money, and UMG.com handles the exchange, which reduces the risk of buying from a stranger.

If you're feeling more daring, try the Recycler's Music Listings site at <http://music.recycler.com>. It's the online version of the weekly classified-ad newspaper where indie rock maveric Beck shops for toys. A side trip to the Used Gear Price List (www.midiwall.com/cgi



Figure 2 Getsigned You could get a record deal with the tips at Getsigned.com — or just look like you have one.

bin/w3-mysql/usedgear/ug_mfg.shtml) will help you determine correct pricing.

Going Software

Just try to visit Shareware Music Machine's Mac software area (www.hit-squad.com/smm/mac) and come away

Teacher's Net

The Web can be an enormous asset for Mac users who want to teach or study music. Start at the **Music Education Launch Site** (www.talentz.com), a splendid collection of links. Enter your zip code at **Music Education Online** (www.geopages.com/Athens/2405/index.html), and it will list nearby human teachers. You'll find a mother lode of Web-based lessons at the **World Lecture Hall's** music area (www.utexas.edu/world/lecture/mus).

The **Technology Institute for Music Educators** (www.ti-me.org) is dedicated to showing teachers how to use technology effectively.



Here is a typical example using quarter note rests. Let's call this the "Kangaroo" song. Note that the time signature is 4/4. Push play on the slider bar to hear how the "Kangaroo" song sounds. I've added something new as you might have already noticed. There are 4 "clicks" that can be heard before the song starts playing. These four "clicks" tell the player what tempo to use to start playing the song. This routine is called "Setting the Beat." Every musician needs to know what the tempo will be in order to start playing a song. At the bottom of the page are more terms or phrases that are used to describe the same routine of "Setting the Beat."

Listen to the song and then play along with the slider bar. Do this for 5 minutes. Then push play on the slider bar and play the song without the slider bar. Do this for 5 minutes. When you are

Just one of the many ear-training and music lessons available on the Internet

Round-the-clock chat rooms at the **Music Technology Learning Center** (www.mtlc.net) point the way to interactive learning and advanced experimentation: In the future, instructors may be able to trigger musical examples directly in the chat rooms. Professionally written articles on music technology are reprinted at the **International Association of Electronic Keyboard Manufacturers** site (www.iaekm.org).

Ivory ticklers will delight at the discriminating links on the **Piano Education Page** (www.unm.edu/~loritaf/pnolinks.html). And a well-produced series of piano lessons is yours at **Piano on the Net** (www.artdsm.com/piano/index.html).



Figure 3 DreamFluid crop Control-clicking on a QuickTime playback bar lets you “scratch” audio like a DJ. Check it out at the Mousejam site.

The latter lets you enter two words and find a rhyme that relates them! For example, “Quick Time” generates “fast/past”, while “disk drive” spawns “puck/truck.”

The Net can often get you out of a jam. Now, thanks to free software from Res Rocket (www.resrocket.com), it can get you into one as well. Rocket's Distributed Realtime Groove Network combines an online chat room with a MIDI sequencer. (See “Hello MIDI” on page 14 for background on MIDI.) Say you have a melody running through your head. You log onto the Res Rocket site, enter a studio, and start recording. As soon as you're satisfied, you upload your melody, and anyone around the world who's connected can hear it play back on their synthesiz-

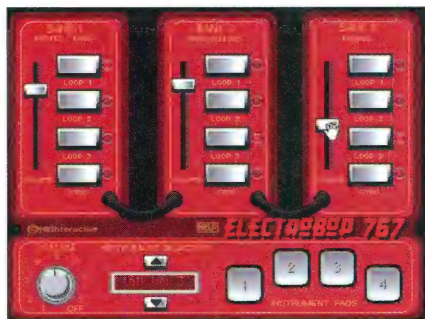


Figure 4 Electrobop E Mix grooves with the sliders, tap out funky talk-box solos on the keys. Electrobop is red-hot musical fun.

er. They can then add chords, a drum pattern, a countermelody, or whatever, and upload that. A chat window lets you type messages back and forth with the other players as you build up the piece.

The latest incarnation of the Rocket technology supports audio as well as MIDI, so vocalists, guitarists, and even brass players can get in on the act. It's impossible to imagine what sort of

amazing music this instant worldwide collaboration might produce. Is global harmony at hand?

The Biz

Songs in hand (or on disk), your next step could be to look for a record deal. Plenty of Websites exist to help you along, from the homey (<http://Indie-Music.com>) to the practical (www.get-signed.com — Figure 2). Zebra Music (www.zebramusic.com), which carries the earnest tagline “helping musicians survive,” is a veritable link bonanza.

If you don't feel particularly good about signing your soul over to a greedy record company, bring your music to the world yourself. Sites such as Billboard Talent Net (www.billboardtalentnet.com), Independent Distribution Network (www.idnmusic.com), indyMusic.com (different from Indie-Music), the Internet Underground Music Archive (www.iuma.com), and Netwaves (www.netwaves.net) are eager to help you promote and sell your tunes online.

Fun!

After bombarding your eyeballs with blurry Web text for a while, you'll definitely want to take a break. The following sites use interactive audio to serve up instant musical recreation. Mouse Jam's Dream Fluid page (www.mousejam.com/dream.html) plays a rhythm track in the background via QuickTime. Clicking the numerous “Play” buttons will fire off short riffs and sound effects. But the fun comes when you press Control and click on the gap between the fast-forward and rewind buttons — they transform into a slider. (See Figure 3.) Moving your mouse then creates DJ-style scratch effects.

You'll need the Shockwave plug-in to explore the amazing cyber-instruments at Sound System 7x7 (www.ss7x7.com). My favorite, Electrobop E, lets you mix three sets of grooves, then play talk-box solos just like Peter Frampton with the 1–4 keys on your Mac's numeric keypad. (See Figure 4).

The Touch-Tone Gizmo (www.att.com/rock/gizmo.htm) takes QWERTY jamming a step further. The 0–9 keys are mapped to a major scale, and you can play along with “Do Wah Diddy Diddy,” even triggering chords. It only



Figure 5 Touch-Tone Gizmo The touch-tone phone was AT&T's first and only musical instrument. Play this top-secret prototype online and imagine what could have been.

works with Netscape, and it requires the Beatnik plug-in from www.headspace.com, but the sound is astonishingly good. (See Figure 5.)

Would you rather play a conventional instrument? Visit the FGO MIDI Jam Files site (<http://members.aol.com/Tmidiman/jam.html>) and click on a

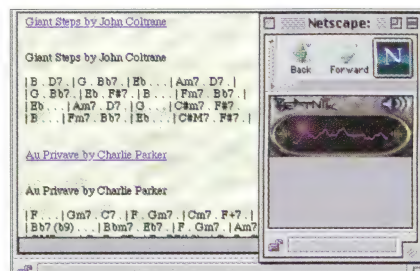


Figure 6 FGO MIDI Jam When you click a song title at the FGO MIDI Jam Page, backing tracks play. Pick up your guitar and strum along.

jam link. If your browser is configured correctly, you should hear backing tracks. Keep your eye on the chord chart and play along (See Figure 6). You'll soon see why for musicians and music lovers, the Net is love at first site. **MII**

As editor of Music & Computers magazine, David Battino encouraged columnist John Poultny (now with MacHome) to seek out bizarre music shareware. The uproarious results at www.music-and-computers.com/magazine/downzone.html.

Talent Show

Undiscovered Music on the Net

Bookmarks has always been a staunch individualist, though this practice occasionally results in not winning any popularity contests. To wit: hanging around San Francisco's Mabuhay Gardens and L.A.'s Madame Wong's circa 1977, enamored of the loud, fast punk rock, yet refusing to alter our own mannerisms and clothing for the occasion. Oftimes we were set upon by young toughs who suggested that our main value was as a cheap, replenishable source of new boots and leather jackets.

Despite numerous facial fractures, our pursuit of unusual music never subsided. Only the methods have changed. Thank goodness, then, for such resources as Billboard TalentNet. This site's purposes are legion — first, you can browse the artist listings just as if you were in a record store and listen to snippets of music, should something strike your fancy. There are many genres from which to choose, including a cappella, folk, funk, and Bookmarks' nostalgic favorite, thrash. TalentNet provides hours of fun for the musical devotee searching for the next big thing. Should you wish to share your own music with the world, the site offers you several options, albeit at a price. A basic \$20 annual membership lets you slap up a page with one song snippet, a photo, and contact information, while a professional membership, ranging from \$99 for one month to \$488 for a year, lets you put up three compositions and more info about yourself, and also makes you eligible to be "ranked" by the site's users and possibly included in a weekly RealAudio-based radio program sponsored by the site. This show plays the site's top 50 songs, as ranked by the surfers themselves. It goes by ranking, not genre — so you might find a country song followed by hip-hop, followed by punk. Eclectic listening for these complicated times.

There are lots of sites you'll find new music aside from this one; three worth a slap-and-tickle include the Ultimate Band List (UBL), and the Internet Underground Music Archive (IUMA), and Songs.com. All present you with a rich, thick, downright *piquant* smorgasbord of sounds sure to please the discriminating palate, and are showing the music biz that a ready audience for material aside from the corporate-bred pabulum continually attempts to foist on the weary public.

Billboard Talent Net, www.billboardtalentnet.com

Internet Underground Music Archive, www.iuma.com

Ultimate Band List, <http://ubl.com>

Songs.com, www.songs.com



O Noble Fife n' Theremin

A Civil War buff from way back, Bookmarks has long leant a curious ear to fifes and the like for their strangely inspirational and patriotic tones. Hence our interest was piqued when we chanced upon the Online Music Lessons site, "where you learn to play inexpensive musical instruments on the Web." Indeed, it specializes in lessons for the tin whistle, recorder, fluteophone, native American flute, and yes, fife.

A password for the site costs between \$10 and \$20 per class and is good for six months. Register and you can access the lesson pages, which include text, photographs, audio/video clips, and MIDI files which help to teach the various instruments. You'll have plenty of time to explore these very portable and cost-effective instruments. Online Music Lessons also understands that many people don't have early wind instruments just lying around the house, so it sells these at a reasonable cost.

If you're like most folks, you've probably always wanted a theremin — that otherworldly musical instrument featured in sci-fi movies and that "Good Vibrations" song by the Beach Boys. However, these are scarce and expensive, given the somewhat limited market for scary-sounding electronic devices.

Then by God, get out the soldering iron, resistors, capacitors, diodes, and rectifiers, and hit the Build Your Own Theremin page.

There's help with the tricky parts, such as where to find schematics and parts. You'll soon be frightening the neighbors late at night.

Online Music Lessons, www.onlinemusiclessons.com
Build Your Own Theremin, www.he.net/~Enternet/teci/teci.html

A Sporting Summer on the Mac

Sports and Software Get Along Just Fine

The long, hot summer looms. For many, that means looking into invigorating outdoor activities for a strong mind and body. But are computers and physical activity mutually exclusive? Perhaps not, judging from a smattering of programs we uncovered recently.

Though there are camps that would decry loudly the idea of using a computer to plan one's athletic efforts — after all, it's unlikely that Jack LaLanne used a computer to help him plan that event in which he towed 70 boats behind him, *handcuffed and shackled*, on his 70th birthday, nor is it especially plausible that Charles Atlas used software of any description to assist him in his storied sand-kicking, beach-bully retaliation effort of yesteryear — but there's also the adage that such impressive results dictate an exacting regimen, and that's where this crop of software comes in.

Whether you're an athlete, coach, or statistician, there's something to please most sports-minded folk out there. And there's even a few goodies for the "arm-chair" athletes — you know who you are.

Memo to Self: Run, Swim, Jog

Stevens Creek Software has a full-featured program called the Athlete's Diary, which is a multisport training log to help you keep track of your efforts in cycling, swimming, running, triathlons, and so forth. The software is designed to let you enter your workout data quickly ("30 seconds wasted every day adds up to three hours in a year," notes the company. "Why waste three hours on a com-

puter when you could be running, riding, swimming, etc. with that time?"). It gives you weekly, monthly, and yearly totals and averages of your activities in each sport — time, distance, pace, and the number of workouts.

Standard routes for running or cycling can be set as shortcuts, so that you can enter them with a single mouse click. You can check your progress with combination- or single-sport graphs, which you can even export to other packages. If quantifying results is your schtick, you can make calculations based on your workout data to determine heart rate, race times, and calories burned.

For those of you reluctant to bring large, unwieldy computers with you on your workouts, Stevens Creek has a Palm OS version of the software, which syncs the data between your Mac and any Palm PDA.

For teachers and coaches, Perfect Impressions offers several track-related packages to help with the details of arranging, scoring, and summarizing meets. Track-on-a-Mac and MacCross Country perform similar functions for

general meets, letting you enter details on participants and create rosters and race bibs, while MacCathlon is specialized for scoring decathlons and heptathlons. MacCathlon can send its results to Track-on-a-Mac for inclusion in scoring. For meets using precision timing equipment, Track-on-a-Mac imports data from electronic timers such as Finish Lynx, Sprint 8, Time Machine, and Chronomix.

For those days when you just can't leave the desk to go running, Shelter Publications offers a nice little program called Stretchware that periodically reminds you to perform various stretch-



ing exercises in the comfort of your private cubicle or office. The software combats the very maladies that extended computer use produces, says the company. The suggested activities are tailored for specific types of computer use; see the Education News section in the March 1999 issue of *MacHome* for more information.

Let the Cool Waters Cleanse You

Swimming is a perennial favorite among athletes, as it provides a whole-body workout while supplying a cool, refreshing experience at the same time. What's not to like? Calculating statistics for large numbers of swimmers, perhaps, or rehashing the correct techniques for your various strokes. Tropical Penguin's Cool Coach aims to simplify such onerous tasks. The package has video clips for learning strokes and several Microsoft Excel templates for calculating stats quick-like. You can use the software to formulate individualized workouts and to plan out a swimmer's entire season, with printable graphs and "report cards" available to spur athletes to their goals. Tropical Penguin also has a CD-ROM, called Cool Digital Swimming, that has the video clips but not the other software; it's \$50.

Play It as It Lays

Golf's relentless march across the cultural landscape during the past few years has manifested itself in several software titles, and probably too many CD-ROMs to count. Should you wish to improve your game, and that usually seems to be the plan, you might want to check out GolfMac, a nifty shareware tool from ForePaws. This package, ultimately aimed at helping you compile your statistics, includes a scores register, course database, statistical analysis, personal handicap index, and a "ScoreSheet" shortcut so you can enter scores quickly.

When it comes time for analysis, GolfMac computes your amount over par; the average score for each par type; the total number of strokes taken with each club; the number of eagles, bogies, birdies, pars, and other score categories; and the percentage of holes scored in each. The software provides graphical representation of hole scores in relation to par, charts of your 20 most recent games, and also computes your handicap based on a weighted average over your

10 most recent games.

Schiwall Scientific's StatDoctor performs similar functions, with an emphasis on analysis. The program tracks common stats, such as handicap, fairway hits, greens in regulation, and putts, as well as any number of user-defined mistakes (such as failing to get out of a bunker or slicing a drive), so you can see how many strokes these cost you per round. Like GolfMac, StatDoctor has built-in report and charting functions.

Mulligan Software's Golf Personal is another full-featured golf-scoring and analysis package; this package includes information on more than 400 golf clubs in addition to the basic golfing software. And if rules hang you up, Mulligan's Rules of Golf delivers the

United States Golf Association's official Rules of Golf (as well as the underappreciated Rules of Amateur Status) without your needing to open a separate application. This program, available separately or as part of Golf

Personal, loads as an Apple Guide document, which is instantly accessible from your Finder menu or from within an application. Like the standard Apple Guide, Rules of Golf appears as a series of windows encompassing various topics and terms; definitions are hot-linked to golf-specific lingo. Take a PowerBook along with you on the green and use Rules of Golf to look up penalties or answer questions as you play. Just watch for sand traps, as sand can be challenging for hard drives.

Another choice for golfers is Barking Spider Software's GolfMeister. This package also handles statistics and reports, but it doesn't do graphing.

Who's In? Who's In?

If all the analysis and discipline and structured workouts get to be too much, you can still enjoy a little vicarious sporting action with RSS Software's Mac Quarterback Office Pool Manager. As its

name implies, this program helps you out with the all-important duty of setting up an office pool to wager on the outcome of a football game. And don't underestimate the importance of this function in today's workforce, you. **III**

Product Info

The Athlete's Diary

\$59, Stevens Creek Software
(Palm OS version \$39)
800-423-8279
www.stevenscreek.com/tad.shtml

Cool Coach

\$329, Tropical Penguin
562-944-5663
www.tropicalpenguin.com

GolfMac

\$18, ForePaws Inc.
<http://members.aol.com/golfscore/index.html>

GolfMeister

\$20, Barking Spider Software
www.inforamp.net/~ramjet/barking.html

Golf Personal and Rules of Golf

\$39 and \$10, respectively,
Mulligan Software
www.mulligansw.com

The Mac Quarterback Office Pool Manager

\$25, RSS Software
www.rsssoftware.com/quarterback/index.html

StatDoctor

\$25, Schiwall Scientific
www.netaxs.com/~schiwall/statdoctor.html

Stretchware

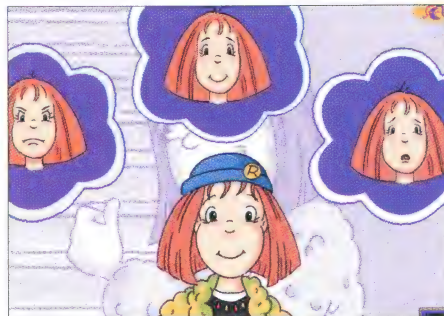
\$39, Shelter Publications
800-307-0131
www.shelterpub.com

Track on a Mac, MacCross Country, MacCathlon

\$299, \$199, \$49, Perfect Impressions
800-738-3622
<http://netdex.com/~pete/>
(Perfect Impressions' products also require ProVUE Development's Panorama database package, about \$295 from ProVUE, 800-966-7878, www.provue.com. (Educational discounts available))

Purple Moon Lives!

For a while, it looked like Mattel's Barbie had vanquished Rockett Movado, late of Purple Moon Software. The girls'-software manufacturer abruptly ceased operations last February after the company's series of friendship adventures for girls — Rockett, Star Fire Soccer, and Secret Paths — was hit hard by the competition in 1998.



Purple Moon, however, was down but not out. The Website remained up, products continued to appear in stores, and now it seems the spoils will go to the victors: Mattel recently announced that it will acquire Purple Moon, rounding out its offerings of girls' software, which includes the American Girls series and Barbie titles.

Purple Moon Software, www.purple-moon.com

The Dr. is On (Line)

Continuing in that fine tradition of doctors who are known only by their first names, Dr. Paula (Elbirt) is the backbone of the largest pediatric Website in the world. Brimming with more than 10,000 pages of resources and free advice on childcare, drpaula.com gives users the heads-up on product recalls, and covers topics from abdominal pain to wheezing, with descriptions, notes on the usual course of treatment, causes, and other useful info for concerned parents. The site also provides a forum for parents to chat with other parents.

Dr. Paula, www.drpaula.com

You Can Quote Me on That

Symbiotic Software recently released *Quotable Quotes*, a collection of 9,000 quotations ranging from classical-era bon mots to modern quips.

It also includes biographical information on top authors and has hypertext capabilities. The database is divided into seven parts: definitions, dichotomies, writing, art, existence, humor, and my favorite, eating.

Symbiotic Software, www.qq2.com

Little Fish on the Prairie

Humongous Entertainment recently released *Freddy Fish 4: The Case of the Hogfish Rustlers of Briny Gulch*. "Freddy Fish 4 is the world's first underwater western adventure CD-



Space: The Gungan Frontier

Lucas Learning is releasing two new titles based on the characters from *Star Wars* Episode 1. The first, due for release this May, is called *The Gungan Frontier* and is a combination of Noah's Ark and a simulation game: Players attempt to create a new city for the Gungans to inhabit. To do this, players choose from plants and animals to



populate a new world, which the Gungans can use for food, and create a stable ecosystem. R2D2 appears to help kids with their choices and to maintain a thriving environment encouraging biodiversity. There are twelve scenarios in all, and a sneak peak shown to MacHome staffers revealed incredible graphics and engrossing gameplay. The title's target audience is your average 12-year-old, but most adults would find plenty to keep them occupied.

The second title in the series, due out in September, (a third is expected at a later date), is an arcade-style game code-named *Tozeur*. Players maneuver Podrace Pit Droids through puzzles based on classic math problems. Each puzzle is based on 48 droids heading for their goal. Players can build their own puzzles and trade them online.

Lucas Learning, \$30 each, www.lucaslearning.com

ROM for children — one that we expect to set the standard for all underwater westerns to come," said Ralph Giuffre, executive vice president of marketing and licensing for Humongous. Seems unlikely that there will be much competition, but a standard must be set somewhere.

In the adventure, Cousin Calico's prized hogfish have been kidnapped by some rustlers. Freddy Fish and Luther offer to find the rustlers' hideout and rescue the fish. The game has a variety of culprits and locations and differs each time. *Humongous Entertainment, www.humongous.com*

WWW

machome.com

*We've got more of
what you're looking for!*

Welcome to the greatest Mac Website on
the Web. Where hourly Mac news, product
reviews, software updates and featured stories
are brought directly to your desktop.

While you're there, check out our monthly print
magazine, *MacHome*, and **subscribe online** to
the nation's number-1 consumer Mac magazine
and receive special gifts and discounts. Order
your favorite Apple apparel, accessories, games,
and CD-ROMs from **MacHome Express**. And
get **free tech support** brought to you by
NoWonder!

Join us online and see for yourself.

machome.com



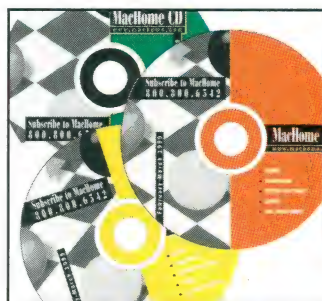
Latest News



MacHome Express Online



MacHome Subscriptions



MacHome CD-ROMs



Free Tech Support

JumpStart Music



\$20, Knowledge Adventure

800-542-4250

www.knowledgeadventure.com

Ages 5 to 8

It's not likely to have kids performing any child-prodigy moves, but *JumpStart Music* offers a basic introduction to the different families of musical instruments (woodwinds, percussion, strings, and so on) and gives kids instruction and practice in keeping beats and identifying sour notes in well-known tunes.

The adventure portion of the CD-ROM involves guiding a bunny around a blue brick road, stopping in to visit various animals that dispense simple, practical musical exercises. Once each area has been successfully completed, kids have the opportunity to catch sour notes and put them into a bag. Collecting all the sour notes means that kids have vanquished the evil Sir Sournote and have restored harmony to the land of music.



The interface is a cheery, animated maze, and the characters are engaging, even hip. In one area, a goat snacks on the contents of his garbage pail and then guides kids into keeping rhythm on the can, but not before commenting, "I needed a snack, but daaaaang." The music is cheery and upbeat; big-band clarinet music is as likely to play as jazzy riffs and rock guitar solos. At one point, a hippopotamus appears and teaches percussion in a way that's reminiscent of Laurie Anderson songs. "Ha, Ha, Ha, Ha," she exhales as she slaps out a beat on her belly.

JumpStart Music is incredibly easy for kids to navigate, but my only problem with the interface is that it doesn't allow kids to save games: They must start from scratch if they've ended before collecting all the sour notes, and the repetition may become grating. Exercises are similar in all the areas of the maze, but most kids will be engaged with catching all the sour notes and complete the adventure. It's a nice introduction to the most basic of music basics.

— Anne Marie Feld

JumpStart Adventures 6th Grade



\$30, Knowledge Adventure

800-542-4240

www.knowledgeadventure.com

Ages 10-12

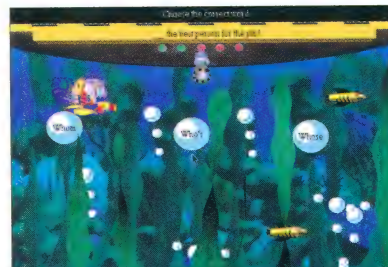
A devious artificial intelligence system has hijacked Earth's World Watch Satellite in an effort to annihilate the planet, or so goes the premise of *JumpStart Adventures 6th Grade*. To stop the diabolical destruction, sixth graders must do their best to answer any of the three levels of Science, History, Math, and Language Arts questions.

Thanks to killer graphics, convincing sound effects, and a whole heap of engaging activities, students will feel that they are reading an interactive comic book, watching a space-age teenspolitation flick, and playing various video games all at the same time. But between you and me, they'll actually be learning about isotopes and decimeters, Chinese history, and the proper usage of "who" versus "whom." Sometimes the subject matter is esoteric: You might ask what twelve-year-old really needs to know that Alexandria is the locale where the Ptolemys developed a library, but the basics are well covered, and tutor mode allows players to brush up on subjects they find most difficult.

To start, pre-teen adventurers join the dynamic young duo Jess and Zack at EarthQuest headquarters and select a mission by clicking on one of the maps' many crisis icons. In the mathematics mission, "Insect Overthrow," moving the game piece across the screen to the correct numerical answer was an arduous process. The mechanics work much better in the history mission, "Monument Mischief," where players jump, Q-Bert style, up and down the Egyptian pyramids in an all-terrain pogo-pod while answering challenging questions about Alexander the Great and Ishtar. Even better was the geography- and grammar-focused "Mine Games," where players direct their submarine (the under-water effects here are quite wonderful) towards the air bubble containing the correct answer. When asked to name the past participle of the verb "sleep," guide your sub to "slept," and you are one step closer to saving the world.

When players need help, they can call on the twins' eccentric Uncle Eli, who'll jump up to explain the rules of the game. But if a player doesn't know an answer (for instance, very few people or pre-teens know who Ishtar is — she is an Assyrian goddess of love), Eli will be of no help. But any ten- to twelve-year-old will consider the CD-ROM's brain-building missions cool, and parents will appreciate being able to check their child's progress.

— Amy Shafroon





Spy Fox in Cheese Chase



\$10, Humongous Entertainment

800-499-8386

www.humongous.com

Ages 5 to 10

PowerPC required

Spy Fox may be crafty, but speed and agility are what's required to get the kidnapped Limburger cheese back from Russian Blue. It goes to show that brainwork isn't the be-all and end-all. Sometimes kids just want to have fun.

Cheese Chase manages to be fun for a fairly wide age group. The backdrop is Bond-esque: Debonair Spy Fox dons a white tuxedo jacket and black bow tie. Using the mouse, kids maneuver

him through obstacle-laden paths on land, sea, air, and snow, avoiding Russian Blue's hired goons and other perils, while picking up crates of handy spy gadgets — as well as hunks of cheese. The 100 levels get increasingly more difficult, with new obstacles and tricky terrain.

Advanced players can build their own levels. But younger — or more arcade challenged — players can set the Junior Helper to make Spy Fox go slower or wreck less often (or both), an invaluable feature that alleviates frustration in beginning gamers.

Quake-playing youngsters will dismiss *Cheese Chase* as babyish. Spy Fox shoots only pies, bananas, or toilet plungers; goons fall from the sky wearing parachutes; and no one dies. But parents seeking more wholesome alternatives for their action-craving kids will welcome this charming arcade game.

— Carrie Shepherd



Putt-Putt Enters the Race



\$30, Humongous Entertainment

800-499-8386

www.humongous.com

Ages 3 to 8

PowerPC required

Putt-Putt Enters the Race finds the cheerful purple convertible eager to enter the Cartown 500. But first he needs to get some high-octane gas, radial racing tires, a triangular flag with his official number on it, and a safety helmet for his pal, Pep. So begins his adventure around Cartown, searching for the required items.

This adventure game is easy enough for the younger players, while still being engaging enough for the older ones — no easy feat. Putt-Putt meets many motorized characters on his mission — some who need his help and some who help him out, too.

Logic comes into play: Where was there something to get that cat out of the tree? How can I see what's in that dark tunnel? Kids learn the value of money, sort of. For 3¢ they can change Putt-Putt's color; for 2¢ they can take him through the car wash. And they learn about recycling: Putt-Putt collects bottles to exchange for coins at the recycling plant.

Kids will want to play again, because the quests change each time they play. My favorite surprise had to be when cars at the track sang the catchy tune, "Go Putt-Putt Go," a song worthy of a feature film.

— Carrie Shepherd

Big Action Construction



\$20, Fisher-Price

800-542-4240

www.knowledgeadventure.com

Ages 4 to 7

Instead of beating their younger siblings senseless or scribbling on the new wallpaper with indelible markers, kids can now spend their time demolishing things and be rewarded for it.

Big Action Construction begins with friendly Foreman Frank breaking into song: "Put on your hard hat, put it on tight, get ready for big action — down at the construction site." He's not singing to hear the pitch of his own timbre — he is advising kids to print up and cut out the big yellow hard hat which appears on their screen. String — and the help of an adult — is required for the hat's assembly, but soon enough kids will independently rush

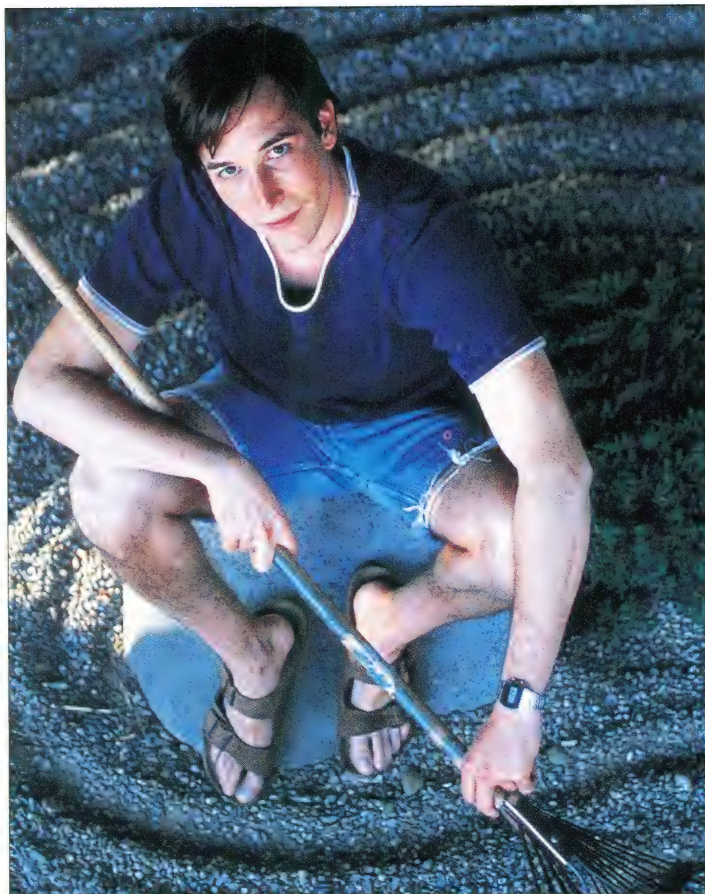
off to the main screen where they can choose from seven different activities, each of which earns them collector cards that can be printed as certificates.

In the Dump Truck activity, kids learn to wash the windshield, pump gas, and fill a flat tire with air. Only the simplest mouse movements are necessary to complete these tasks, and kids are guided along by helpful arrows and repeated directions. At the Building Site, kids must clear an area to construct a new development. While it was fun doing 360s with the tractor, excavating the foundation was difficult, and the blueprints failed to result in habitable constructions. Kids will find it more satisfying to tear things down. Wrecking Ball lets kids demolish buildings, and in Boulder Blast, kids repeatedly drag dynamite to the quarry wall and push the plunger on the detonator. Each explosion allows for the recovery of hidden treasures.

True to life, the most enjoyable activity of the day is Lunch Break. Here the goofy animated characters serenade kids with five original rock 'n' roll songs (lyrics are printable), including "Dig It" ("Digging all day long, singing this digging song.") and "Lunch Break" ("We can rest our aches, we can eat all we want until we get tummy aches..."). Speaking of which, the software's most constructive construction comes when you least expect it: At the lunch cart, kids can build and rebuild super sub sandwiches (ingredients include marshmallows, bacon, bugs, and pickles) until it's time to get back to work.

— Amy Shafroff





Of Pirates and Pioneers

Pirates of Silicon Valley paints Steve Jobs as a dreamer who sees what he believes and Bill Gates as a realist who believes what he sees. It also portrays them both as thieves. Fact or fiction? We ask the film's writer/director Martin Burke.

announced that Microsoft had placed a vote of confidence in the strug-

schemes, trickery, lies, drugs, revolution, and piracy. And, according to Martin Burke, the film's writer and director, it's all true.

MacHome: I enjoyed the movie. Do you consider it myth making?

Martin Burke: It's a kind of myth

making. One thing we tried to do, though, was stay as close to actual events — and sometimes conversations — that actually happened.

We put in six months of intensive research. It was based on 30 to 40 books and magazines and articles dating back to the 1970s. We used everything on the Internet we could find. We

visited the computer museum in Palo Alto. Every scene we put in there actually happened. I guess it's mythology, but it's also a true mythology.



The *Pirates of Silicon Valley* opens with Apple founders Steve Jobs and Steve Wozniak in a TV studio watching the filming of Apple's famous "1984" Super Bowl commercial. The ad, which aired only once, shows Big Brother on a gigantic TV screen barking orders at the huddled gray masses of the IBM PC world. A lone female athlete shatters the screen with a hammer, announcing the birth of the Macintosh and the beginning of the personal computer revolution.

By the end of the movie, 13 years have passed, and Bill Gates is Big Brother. Blown up to Gulliver-size, he appears on a gigantic TV screen, his inscrutable smile beamed in by satellite for the huddled masses at 1997's Macworld Expo keynote, where Jobs

gling company by making a symbolic multimillion-dollar investment. In the intervening two hours, the movie spins the outrageous and entertaining tale of the rise of the PC industry.

The \$10 million production centers around the tumultuous relationship between Steve Jobs, played by ER's Noah Wyle, and Bill Gates, played by Anthony Michael Hall, best known as the nerd in *The Breakfast Club*.

Without ruining the plot, it tells how Steve Jobs helped launch the PC industry only to become another of Bill Gates's minions.

It's a tale of inflated egos, wild

MH: But you had to take some license, right? Some of it was pretty outrageous.

Burke: No, not really. Bill Gates actually was thrown in jail for speeding. And Steve Jobs did prowl the Mac development building at all hours of the night bullying employees.

There's one scene where Gates and another Microsoft employee race some earth movers. Well, Gates and Chris Larson and some other Microsoft employees found some bulldozers in an empty lot in Albuquerque. Over the course of a week they learned how to drive them and raced them up and down the lot. In the movie, the events of a week are condensed into one night.

In the film we show Bill Gates's bulldozer hitting Paul Allen's car. It was his pride and joy. I don't know if Bill Gates hit it with the bulldozer, but he did scrape [the car] up and they had a big fight about it. It's one of the only things where we took a liberty.

I've got a thick binder that sources every scene at least once. Some scenes are sourced three or four different times.

In some cases we used the actual dialogue. In one scene, when Jobs tells Gates they are artists, in the Picasso room, those words are the actual words he used. He said sand goes in at one end and art comes out the other. But he made the speech to some Microsoft executives in the early days of their relationship up in Seattle, not in the Picasso room.

Gates did yell at Jobs that they were like kids who both robbed a rich neighbor, but Steve Jobs got there first.

MH: You didn't pull many punches in your portrayal of Steve Jobs.

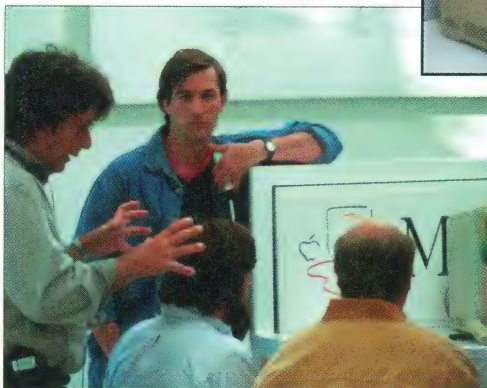
Burke: I view Steve Jobs as one of the more amazing Shakespearean characters in American public life. He is already a legend in his own lifetime. He is driven by Shakespearean furies and is one of the most interesting characters, dramatically, I've ever encountered.

Jobs was obsessed with finding his mother. It was an overwhelming preoccupation. Though it wasn't shown in the movie, he hired a private investigator to

track her down. He was an object of awe, inspiration, and fear.

In the boardroom interview, he actually put his bare feet up on the conference table and asked a job applicant if he was a virgin. That actually happened. It's all true.

He reminded me of Richard III, when everything about him has been laid waste, and he's crying, "A horse, a horse, my kingdom for a horse."



MH: Noah Wyle looks like Jobs.

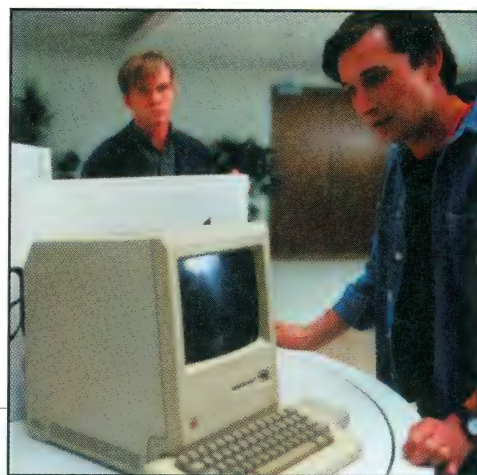
Burke: I chose Wyle for the haunting similarity to Steve Jobs. We did a mock-up of the 1982 Fortune cover and the similarity was uncanny. They look like twin brothers.

It wasn't quite as natural for Anthony Michael Hall. He had to reconstruct himself to play Bill Gates. He had to learn that funny walk Gates has. The way he slouches when he sits. The way he jerks his knee up and down.

MH: Where did the idea for the movie come from?

Burke: I'd been fascinated for years watching Steve Jobs. It was a love-hate relationship. Turner wanted a history of computers, and I was interested in doing the story of these two guys who were emblematic of the revolutionaries of their times. But they weren't counter-culturalists or anti-war demonstrators. Steve Jobs and Bill Gates did more to undermine the American business structure than the anti-war protesters of the time.

MH: It's been reported that you



wouldn't let the actors meet the people they portrayed.

Burke: We didn't want to do the authorized version. We didn't want Anthony Michael Hall playing the Bill Gates that Bill Gates wanted him to play. But the actors studied hours of video tape to get the man-

nerisms just right. This was intended to be a movie. It was never meant to be a documentary.

MH: There's a scene where Steve Jobs is tripping [on hallucinogens] in a corn field. Was that based on fact?

Burke: He took a fair amount of acid at that time, in a commune, the All-One farm in Oregon. The same trip occurred a few times, where he saw himself in a corn field hearing classical music. He was hearing Bach, and what amazed him was he could conduct nature. The corn moved with his conducting of the music.

The only thing we changed was the name of [Jobs's daughter] Lisa's mother. We weren't allowed to use her name because she's not a public figure.

MH: What kind of feedback have you had? Has anyone at Apple or Microsoft seen it?

Burke: We had some indications that Microsoft saw the film. Or at least parts of it. We were contacted by the Microsoft public relations department. They wanted to know what the tone of

New

introducing the

iMac Buyers Guide™

Subscribe to the
#1 iMac Authority

Now for every iMac Owner.

Every issue is guaranteed easy to read and easy to understand.

Packed with information, reviews, tips and trouble shooting guides that every iMac owner will find invaluable. MacHome has a long history of serving the Mac owner and now we're bringing this same editorial excellence to you the iMac owner. If you own an iMac or are about to purchase one, then don't miss an issue.

Subscribe Today!

Here's what you'll get:

- 6 Issues iMac Buyer's Guide.
- The iMac Tips Newsletter - Delivered every week via email
- Access to subscriber only pages on companion website www.imacguide.com
- Special discounts on Apple Logo Hats and T-Shirts thru MacHome Express



All for only

Canada/Mexico add \$10.00
Other Foreign add \$20.00

Subscribe on our website...

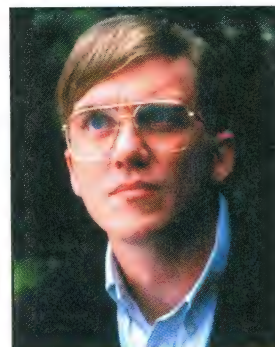
www.machome.com/imacbg.html

or call

Call 800-577-4622

the movie was like. I don't know if they saw it. I'd tell you if I did.

It seems to have touched an amazing nerve. It's gone through the roof. I've done in the past couple of weeks lots and lots of interviews. It's kind of gotten pretty huge.



MH: Do you think anyone might sue, especially with all the attention?

BURKE: Anyone can sue anyone else in this country. But we have the defense that it's true. It's been vetted by lawyers from every angle. There's nothing malicious or libelous.

MH: Are you a nerd?

BURKE: I barely know how to switch a computer on. I'm not a person who really understands how a computer works.

MH: What kind of computer do you use?

BURKE: I'm an IBM user that always felt he should be an Apple user. I only use laptops. The one I've got is getting pretty old now. I want to get a new one, but I want something really light. One of the crew told me to wait until Apple releases its new portable for consumers this summer. So I'm waiting for that.

MH: What do you make of Mac users?

BURKE: Mac people are real Trekkies. They're obsessed. I've discovered the fervor and the passion of Mac people.

The crew was split pretty evenly between Mac and PC users, but the Mac people were much more passionate. They were spirited to convert the rest of us. Everywhere you go in the film industry you find Apple people. They're like Scientologists. They're always looking for recruits.

MH: What have you done before this?

BURKE: I produced a lot number of documentaries for Canadian TV. I've done a couple of feature films and I adapted TNT's forthcoming *Animal Farm*. I'm also writing novels.

MH: You're a busy man.

BURKE: I get bored easily. I've got to keep busy.

I watched a lot of people looking for drama in murder, in cop shows, and war. To me this was by far the most dramatic subject I could have found.

I saw it as more about revolution than about business. It was flat-out Shakespearean drama to me. **III**

The Pirates of Silicon Valley premieres Sunday, June 20, 1999, at 8 p.m. on TNT.



Great Apple Apparel and Accessories



\$19⁹⁵

APPLE DOGCOW T-SHIRT

The well-known black and white Dogcow icon appears on the back of this 100% cotton Hanes Beefy-T. A black Apple logo and name are on the left chest. Adult sizes M-XXL. #03M00115

MACOS T-SHIRT

Operate in style in this white 100% cotton Hanes Beefy-T. Adult sizes L-XL. #03APL166



\$19⁹⁵



\$19⁹⁵

MACINTOSH T-SHIRT

The original white 100% preshrunk cotton T-shirt, complete with the original Macintosh design on the front and the Apple name on the back. Unisex sizes L-XL. #03APL116

APPLE LOGO COTTON T-SHIRT

Show your apple enthusiasm in this preshrunk, 100% cotton, white T-shirt with six-color Apple logo screened on the front. Adult sizes M-XXL. #03APL190



\$19⁹⁵

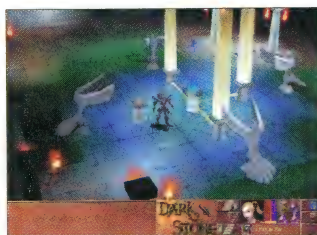
To Order Call 1.800.577.4MAC

Shipping and Handling charges will be added to each order

Upcoming Titles:

Darkstone, a 3-D RPG (role-playing game), puts players in pursuit of seven magical crystals to empower a mystical orb. Players simultaneously control two heroes on the journey through 32 unique dungeons, facing lizard men, scorpions, and vampires as well as underworld bosses. Internet or LAN play is also available. It sounds something like *Spinal Tap: The Medieval Days* and is being distributed by the appropriately named Rockstar Games Partnership.

Gathering of Developers: www.godgames.com



Do you Take Checks for Avatars?

In the digital who'd-have-thought file goes this little factoid: An avatar (like a digital persona) for the PC game *Ultima Online* sold for \$521 on eBay, an online auction site. "Turbohawk" was just trying to gain some compensation for time spent building up experience (which translates into better tools and strength) when he got a second job and decided he didn't have time to play any more.

Take Me out to the Ball Site

Those of you who think you can outthink a Joe Torre or a Jim Leyland can test your skills on *Cyberskipper*, an interactive fantasy baseball game. Simply log on and plug in predictions for nine players from the roster of your favorite team. Points are awarded based on actual statistical performance of the players on a game-by-game basis throughout the season. This is fantasy only: As David Letterman would say, "Please, no wagering."

Cyberskipper, www.Cyberskipper.com



Batman Is Doomed

Doom fans will be chuffed to play the free *Batman: Doom 2* conversion, recently released for the Mac (PC version is forthcoming).

Developed by Ace Team

Software (comprised of three Batman-wor-

shipping brothers), the 6.1MB downloadable file has 20 new characters, including Batman, Two Face, Penguin, and the Joker. Alfred and Robin, however, didn't make the final cut. New weapons, new music, and 24 additional levels of gameplay make it all worthwhile, especially at the price.

Ace Team Software, free, www.doomworld.com/batman/main.shtml



Invasion of the Star Wars Titles

After a long vacation from the platform, LucasArts gaming has returned to the Mac. *Star Wars: Episode I Racer* offers pod-racing action that parallels a sequence in the newest portion of the Star Wars epic: *The Phantom Menace*, due in theatres this summer.



Players take the control as Anakin Skywalker (or one of 20 other characters) behind the wheel of pod-racing jets with simulated speeds up to 600 m.p.h. The futuristic chariots can be piloted through methane lakes, Tusken-Raider assaults, anti-gravity tunnels and more in a total of eight worlds.

Lucas Arts, www.lucasarts.com

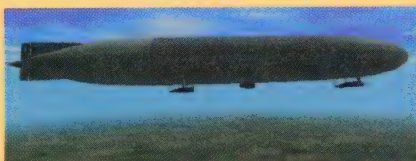
A New Dawn

■ Magic Online recently announced

I Dawn of Aces, a MEGAPlayer online flight simulator, based on the WarBirds engine. Up to 300 players can fly simultaneously, choosing either the Allied or Central Powers, in action that takes place over France. (It's always France, isn't it?) MEGAVoice technology allows players to speak to one another while online. For those of you who don't want to spend hours figuring out the often complex controls of such a flight sim, dedicated trainers will help get new pilots up to speed.

At the time of this writing, *Dawn* is a preliminary release and can be downloaded free from the iMagic Website. *Dawn of Aces* is being tested to see how much interest there is on the Mac side of the fence, so if you'd like to see it come to the Mac, play early, play often.

iMagic, www.imagicgames.com



StarCraft



\$50, Blizzard

800-953-7669

www.blizzard.com

PowerPC required

If you've been champing at the bit, waiting for the long-delayed Mac version of Blizzard's blockbuster space-strategy game *StarCraft*, give your teeth a rest. It's finally here. And it's terrific!

StarCraft, a futuristic outgrowth of *WarCraft II*, is one of the hottest real-time tactical combat games ever to hit the computer. The folks at Blizzard have packed it with three species fighting for survival in a rich, stellar environment; an engaging storyline that keeps you involved; thirty do-or-die battle missions; and a whole bevy of futuristic weapons and alien combat units to tickle your fancy for intergalactic warfare.

You get to play all three species. That's part of the charm, because each is radically different from the others, with its own units, technologies, abilities, and mental attributes. You begin with the Terrans, a feisty bunch of hillbilly-talking, country-music-loving humanoid warriors. These guys deploy tough Marines, fighting robots, and spaceships in a more-or-less conventional manner. They fear nothing, not even rival offshoots of their own species.

Then you move on to the hissing, mucous-dripping Zerg, an insectoid species that procreates rapidly. The Zerg exist in swarms and produce a deadly living biomatter called Creep that spreads quickly and continues to regenerate until the colony is destroyed. The Zerg can also insert parasites among enemy units, allowing the Zerg Overmind to see through the eyes of an enemy host.

The final species is an advanced line of near-humanoids called the Protoss. The Protoss are stubborn and conservative, and they think very highly of themselves. Their weapons are powerful and they possess psionic abilities that can be used to create mental chaos among attacking units, sowing hallucinations so strong that enemy soldiers will waste their firepower on illusions.

Battle tactics, distinctly different for each species, are important, but they aren't the player's only concern. As with any solid real-time strategy game, *StarCraft* stresses mining and exploration just to keep the wheels churning. Resources in the form of a blue crystal substance and volcanic vespene gas must be gathered and processed to make new buildings and forge new battle units. If you run out of resources, you either shift to some newly discovered mineral field, or watch your troops die of malnutrition.

The maps are isometric line of sight with real-time light sourcing. The terrain varies from desert to snow-covered ice fields. There's nothing really new here, but the graphics work. You fight your way across ruined planets, on vast space platforms, or deep within sprawling installations. Laser blasts streak across warped surfaces. Enemy structures blow up with satisfying realism.

It's an easy game to learn and to play. A pleasantly integrated tutorial teaches the basic moves, and the easy mouse/cursor interface is pretty much the same as it was in *WarCraft II*. You can click on single units and give them instructions, or you can click and drag a rectangle around an integrated group and move them all at once. There are also intuitive hot keys for the more advanced player. Once you've mastered the essentials in single play, you can join Blizzard's free *Battle.net* for teamplay missions and head-to-head competition on the Internet. *Battle.net* provides cross-platform support, which allows stable mixed competition between Mac and PC players.

But whether you prefer to play alone or online, *StarCraft* will plunge you into an immersive universe. The missions are balanced, full of surprises and diverse landscapes, and tied together in a neat package by an imaginative storyline that keeps everything in focus. This is an excellent game and well worth the money. Not only that, but Blizzard promises to deliver the acclaimed *StarCraft: Brood War* expansion set to the Mac sometime this summer, with an extended storyline and 26 new missions.

Oops! There go those teeth, gnashing in anticipation again.

— John Lee



Nethergate



\$30, Spiderweb Software

206-789-4438

www.spidweb.com

Nethergate is Spiderweb's newest creation, a role-playing game that blends history and fantasy. It takes place in ancient Britannia, the last stronghold of magic and the Faerie races. The first decision you will have to make is whether to play the Celts or the Romans. The Romans are experts at war and can wear heavy armor, while the Celts practically fight in their underwear but can cast powerful magical spells. I went with the Celts. They were the underdogs, and they were the ones being invaded by the malicious Romans. As I played further and my characters were enjoying disgusting ritual sacrifices, I realized that the Romans were not necessarily the bad guys.

Regardless of which side you fight on, you can customize the characters in your party. You can create a logical, armor-wearing Roman who loves to whack people with his sling, hates the outdoors, and can't understand what this magic stuff is all about. Or you can create a Celtic druid who has a passion for Faerie

lore but has been cursed since birth. Whatever your proclivities, you can create a character that reflects your quirks and is rewarding to play.

Nethergate, like all Spiderweb games, has



a complex, entertaining, and detailed plot. One night I decided to assassinate the evil Fomarian Queen and then head off to bed. But after the dirty deed was done, I decided to escape from her lair while I was still up. The next time I looked up from the monitor, I had been sucked into another quest. Bed? Forget about it! The never-ending plot was a great outlet for my insomnia. Even though I still didn't get any sleep, I had fun doing it!

There is an ugly trend in computer role-playing games to put more and more emphasis on killing things and less and less on a great story. *Nethergate* is an awesome example of bucking a trend. While evil beings are still killed, the plot drives the game. The reward for winning is similar to that of reading the last chapter of a great book: completing the story.

— Paul Boone

Imperialism II



\$50, Strategic Simulations

800-716-8503

www.ssionline.com

PowerPC required

The folks at SSI hit a home run when they introduced *Imperialism* a couple of years ago. The turn-based strategy game, with its subtle mix of diplomacy and warfare, sold more than 100,000 copies. Will the sequel — *Imperialism II: Age of Exploration* — score as big?

You bet. A Mac/PC hybrid (one of those rare games that we get as quickly as the PC people), *Imperialism II* covers a much wider swath of European history, spanning from the early 1500s to the 1850s. And this time there's a hidden New World waiting for exploration and exploitation.

If you played the original *Imperialism*, you'll find familiar ground here in this complex game. You assume the role of a major world power, with piles of mind-boggling economic, diplomatic, transportation, technological, and military decisions to make. You create your own personal empire and work toward military or diplomatic domination of the Old World, juggling surveyors, builders, engineers, civilian laborers, warships, and land forces.

So what's new about *Imperialism II*? This time, you'll also strike out across the dark portion of the map to explore, colonize, and conquer the resource-rich lands of the New World. Only by taming the newly discovered tribal nations and developing their unique riches and commodities can you dominate the nations of the Old World.

Pitfalls abound: Diplomacy can backfire, neighboring armies may challenge you, and foreign spies can steal your secrets. Produce too little food, and you limit the size of your military forces and work units. Get lazy on the commercial front, and you can go bust in nothing flat.

But don't worry. *Imperialism II* comes with a hefty tutorial that will quickly teach you the step-by-step basics. You can have the computer manage a variety of difficult turn-based decisions for you, but you'll need the human element. Otherwise you may find the computer busily bidding on tobacco and cotton from the New World while your road builders stand idle for lack of iron ore.

Your computer foes are stronger in *Imperialism II*, making surprisingly competitive diplomatic and military decisions. So be cunning. Use your wits and wield a heavy bat. You might even hit a couple out of the park yourself.

— John Lee



Jazz Jackrabbit 2



\$29, Logicware
888-564-4245
www.logicware.com
PowerPC required

I never knew that the creators of *Unreal* were so ... eclectic. This side-scrolling adventure plays very much like a console game (one can't help but draw similarities between *Jazz Jackrabbit 2* and *Bubsy* on Super Nintendo), and that may be *Jazz 2*'s main weakness: Veteran gamers have done this before. We've shot our way through all of *Jazz 2*'s levels before; we've learned how to figure out bosses' patterns. I've played this game hundreds of times before, under a hundred different titles and a hundred different premises.

On the other hand, older gamers sometimes forget that your average seven-year-old doesn't remember such games as

Bubsy, *Contra*, and *Castlevania*. *Jazz 2*'s premise is very inviting to kids aged seven to twelve (especially boys). The premise is quite simple: An evil turtle, thwarted by our hero in *Jazz Jackrabbit*, has decided to



seek revenge on rabbits by traveling back in time to prevent them from ever existing at all.

As *Jazz* or *Spaz*, the player runs through maze-like levels, shooting every enemy along the way. Special moves and tricks fill the game, but there aren't any jaw-dropping innovations.

Jazz 2 has pretty good controls, although I highly suggest investing in a gamepad of some sort. Keep in mind that *Jazz 2* does not support Apple's joystick sprocket. Your gamepad will need its own software to configure game controls. Also, the game is surprisingly difficult at times, especially for a game targeted at such a young age bracket.

The graphics in *Jazz 2* are just average. While it supports millions of colors, many of the graphics are so small that characters and enemies seem overly simplified. The quick-moving game took a few minutes to become accustomed to, with its tiny graphics and darting speed. The music is very well executed however, featuring CD-quality sound.

If you've got some young kids in the household, *Jazz 2* is a decent title for your PowerMac, but we older gamers have been there and we've done that.

— Rafi Guroian

Gridz 1.2



Green Dragon Creations
601-473-4225
www.gridz.com

Wham! Wham! Wham!

That's the sound of a shovel toolbot in *Gridz*, a game of frenzied territory domination. If you've played the game before, you may hear the sound in your sleep. With the latest version — *Gridz 1.2* — you may be fleeing toolbots in your nightmares.

In *Gridz*, you place pylons onto a grid with your cursor, then command an army of toolbots: Builders activate the pylons and allow you to capture an area on the grid, Strikers try to assassinate other players' Builders, and Hackers can be dispatched to destroy other players' pylons. You build points by capturing territory, and with more points, you can buy and place more-capable toolbots. Capture your opponents' home bases to win.

While *Gridz* has always been a really easy game to learn and a blast to play, earlier versions played against the computer were too easy — almost anyone could win every level. Version 1.2 offers an option to make the toolbots a bit craftier and meaner. It helps — somewhat; it turns the skill level up by about 25%. I'd prefer easy, medium, hard, and unreal levels! Instead of cute little toolbots do-de-doing through the game, I'd relish slicing up a maniacal, blood-thirsty pirate toolbot. I may yet get my wish: Green Dragon is working on a sequel.

Gridz does have a network-play component, which may help with the competition problem. (Unfortunately, I haven't been able to find any worthy competitors wandering the MacHome LAN.)* Network play works reasonably well but suffers a couple of minor glitches. Green Dragon graciously provides you with one CD, a master serial number, and seven network play-only serial numbers, but this last feature only works with someone else who has the CD. Over a LAN or the Internet, remote players have a small disadvantage, because their pylons don't appear as quickly as the host player's. Toolbots can be a bit sluggish, too. Overall, though, these hiccups don't inhibit game play.

Gridz is a great game for all ages and all machines — it's one of the few cool games that works on 68K machines. It's still one of my favorite games of all time.

— Alan Stafford

*The views expressed in this review are the editorial opinion of Alan Stafford and do not accurately reflect the skill level of MacHome *Gridz* competitors.



Understanding Viruses

Avoid Nasty Infections on Your Macintosh

The Macintosh platform has never been plagued by viral infections. Still, several potentially destructive viruses are unleashed each year by malicious individuals.

Contracting a Virus

Your computer contracts viruses through interactions with other computers, much as you would in the real world. The two major vehicles for viral transfer are portable media (floppies, Zip disks, and CD-ROMs) and direct connection (the Internet or a local computer network).

Diagnosis

In rare circumstances, a virus might slip through the cracks. Several recent viruses wreaking havoc on the Mac platform include AutoStart 9805, SevenDust, Code 9811, and Word and Excel macro viruses.

AutoStart 9805 is typically spread through CD-ROMs by abusing the AutoPlay feature of QuickTime 2.0 or higher. AutoStart 9805 is only destructive in specific circumstances. After the virus checks mounted volumes, it will start a search for files with specific endings, such as "data," "cod," "csa," and "dat." Any files matching the criteria will be overwritten with random data.

SevenDust exists in two forms: as code within an infected application, and as an extension in your System Folder. The virus often masquerades as a valid extension, using a seemingly legitimate name, such as "Graphics Accelerator" or "CD-ROM Driver." The extension is loaded when your Macintosh is restarted, and it adds viral code to your System file. Once your System is infected, it will infect every application you launch.

Most of the time the virus is nondestructive, but several strains of the virus are programmed to delete items on your hard drive.

Code 9811 browses through your System Folder and attempts to delete any antivirus software it comes across. Then it duplicates certain applications and renames the copies with random upper-case letters, storing them in the same folders. Thankfully, the original applications are fully recoverable.

If an infected application is launched on a Monday (or August 22), there is a 25% chance that it will display its payload — meandering worms that crawl around the screen. The worms will draw the symbol for pi, and the message "You have been hacked by the Praetorian" will flash above the pi symbol.

Melissa is a Microsoft Word macro virus that spreads via e-mail attachment; the e-mail message has a subject line of "Important Message From (user name)," and the message is "Here is that document you asked for ... don't show anyone else ;-)". On PCs using Microsoft's

Outlook Express, the virus will automatically e-mail itself to 50 other people. On Macs, the virus will infect your Word "normal" template, and subsequently infect all new documents you create. It won't send the messages, but if you send an infected Word document to a PC user, it will propagate.



Prescription

If you work in an environment where you are frequently receiving files from unpredictable sources, it's probably best to be proactive by installing antivirus software.

Antiviral applications, such as Norton AntiVirus and Dr. Solomon's Virex, scan every file that arrives on your Mac for potential problems. Be sure to update those applications' virus definitions often; they are posted on the companies' Websites.

If you tend to download files from reputable online software libraries and only occasionally buy new software on CD-ROM, you can rest easy. There are several shareware applications currently available that scan and remove viruses from your Macintosh. The best is Agax 1.1, which searches your hard drive for AutoStart 9805, Code 9811, and SevenDust variants. Download Agax at www.cse.unsw.edu.au/~s2191331/agax/.

However, such shareware applications are purely reactive, removing a virus only after it has been contracted. ■■■

Simply fun

Simply creative

Simply educational

Simply great for business

Simply Macworld EXPO

The Face of Things to Come

It's simply amazing. In a very short time, vast new horizons have opened up in the Mac market. Anything--and everything--is now possible! Discover the most exciting new possibilities at MACWORLD Expo/New York '99!

See and demo all the hot new products from hundreds of industry-leading vendors. Stay on top of new developments that could impact your buying decisions. Take advantage of money-saving specials when you buy products right on the show floor! Network with industry experts and make deals with other professionals. MACWORLD Expo is the best place to learn about the hottest solutions for:

- education and development
- advertising and graphic design
- printing and publishing
- home computing
- digital content creation, management and delivery
- the Internet
- software development
- new media
- gaming

Sponsored by:
Macworld
MacWEEK.com

Managed by:
IDG
EXPO MANAGEMENT
COMPANY

Experience the best at
MACWORLD Expo/New York --
the coolest place to visit this summer! You simply have to attend **MACWORLD Expo/New York** at the Jacob K. Javits Convention Center!
Exhibits: July 21-23, 1999
Conferences: July 20-23, 1999
Visit www.macworldexpo.com
or call 800-645-EXPO

Yes! Please send me more information on
MACWORLD Expo/New York! I'm interested in:

☐ Attending ☐ Exhibiting

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____ Fax _____

Email _____

(If you would like to receive information via email about MACWORLD Expo)

Mail to: MACWORLD Expo, 1400 Providence Highway,
PO Box 9127, Norwood, MA 02062. Or Fax to: 781.440.0357

THIS IS NOT A REGISTRATION FORM.

Playing Full-Screen QuickTime Movies

One of the best ways to show off your new iMac is to play a cool movie in full-screen mode. Unfortunately, most high-quality movies are created for just 320 x 240 resolution. How then can you view them without seeing the Finder and other Mac OS elements in the background? MoviePlayer 3.0 (included with the QuickTime 3.0 package) has a menu option allowing you to display movies without distraction. Under the "File" menu, select "Present Movie." The dialog box that appears contains a pop-up menu allowing you to select a preferred size to view the movie. "Normal Size" presents the movie at its native resolution, while "Double" and "Half" scale the movie accordingly. Movies that have a resolution of 320 x 240 are best presented with "Double." MoviePlayer will automatically change the resolution of your display to 640 x 480 and enlarge the movie to that size.



Alternatively, you can choose to play movies "Full Screen." Instead of resizing your display, MoviePlayer simply scales the movie up to your current resolution. Unfortunately, displaying a 320 x 240 movie at 1024 x 768 can result in chunky, visible artifacts. Moreover, movies that have nonstandard width-to-height ratios, such as the Star Wars, Episode I theatrical trailer, are squished horizontally when presented. The best way to display these movies is to grab the resize tab in the lower right hand corner of the movie window and expand it to the width of the display. To view the movie optimally, select "Current" in the "Present Movie" dialog box.

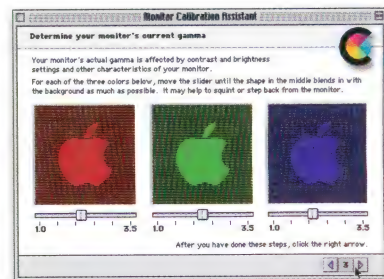
Expand Your Viewable Area

Look closely at the black space between the visible image on your monitor screen and the monitor casing's plastic border and you'll see two distinct borders: an outer border that is solid black, and an inner border that appears dark gray. This dark gray area is wasted screen real estate. Owners of iMacs, All-in-One Power Mac G3s, and AppleVision (ColorSync) displays can use the Monitors & Sound control panel to expand the screen image to fill the dark gray area.

Launch the Monitors & Sounds control panel and click the "Geometry" button second from the right. You're then presented with a list of six possible adjustments. To expand the screen, click on Height/Width and use the controls at the side of the monitor graphic to expand the width and height of the screen image, filling up the dark gray area as much as possible. If your screen image is not centered, choose the Position option and use the controls to reposition the image. Use the latter four controls — Pincushion, Rotate, Keystone, and Parallelogram — to adjust the shape and orientation of the screen image. If for any reason you are unhappy with your changes, simply click the "Factory Settings" button to revert to the display's presets. You'll need to specify geometry settings independently for each resolution.

Optimizing Color Quality

The color quality of a display is an important factor for many graphic designers and gamers. Variations in manufacturing often lead to variations in color between displays, and it's important that you are seeing the same color as your friends and coworkers. To that end, Apple has incorporated a Monitor Calibration Assistant with all new Macintoshes. The Calibration Assistant



tweaks the contrast, white point (warmth or coolness of white), gamma (brightness scale), and color balance of your display to ensure you're seeing color correctly.

Open the Monitors & Sounds control panel and click on the button labeled "Color." You'll be presented with a list of ColorSync Profiles. Below that list, you'll see a button titled "Calibrate" Click on this button to launch the Monitor Calibration Assistant. The Assistant will ask you for your preferences on several important items. It's a good idea to make sure the room is properly lit and reflects your normal work lighting. The first issue to contend with is brightness and contrast. The dialog box will show a black square containing a very dark gray oval. If you cannot see the oval at all, your brightness is too low. If the oval is readily visible, the brightness is too high. Only when you can barely see the oval will the brightness be correctly set.

Next, you must perfect the color 

Virtual Memory

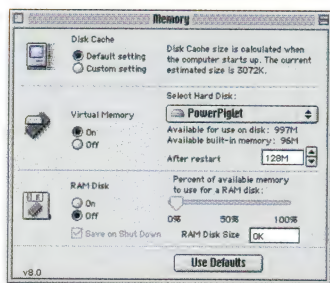
It's happened to all of us. You're using your Macintosh with several applications at once, and when you try to open just one more application, you're confronted with the dreaded dialog box: "There is not enough RAM to open this application." If this occurs frequently, it's probably wise to purchase some additional RAM. However, if you encounter this message only every once in a while, there may be no need to rush out to the local computer store.

Virtual Memory is a technology built into the Mac OS that allows your computer to treat a portion of your hard drive as usable RAM. When installed, Mac OS 8.5 automatically assigns the computer 1MB of virtual memory. To take really full advantage of the technology and give yourself some breathing space, you'll need to increase the amount. Open the Memory control panel and make sure Virtual Memory is turned on. Bump up your RAM by no more than 32MB. (For example, if you have 96MB of real RAM, configure your Macintosh with 128MB total). You must restart your Macintosh for the changes to take effect.

When the Mac OS detects that you're running low on memory, it will write the currently inactive portions of RAM to the hard drive. This frees space in real RAM, allowing you to open additional applications. When you switch back to an inactive application, the Mac OS simply writes other inactive portions of RAM to the hard drive and reloads the application's RAM contents.

There are additional advantages to virtual memory. Many applications require significantly less RAM when virtual memory is active. You can see the benefits by clicking once on an application and selecting "Get Info" from the "File" menu. In the window that appears, choose the "Memory" option to see the application's RAM requirements. Microsoft Word, for example, requires 9,000K. Yet as the window warns, "Memory requirements will increase by 4,620K if virtual memory is turned off."

Still, a small number of applications are averse to virtual memory. Since the technology requires that the contents of RAM be frequently written to and read from the hard drive, it can sometimes slow down the overall performance of the computer. Applications that require the full attention of RAM are thus hampered by virtual memory. When launched, such applications warn you that they are operating in virtual memory-compatibility mode and suggest you turn the technology off for optimal performance.



Optimizing Color Quality

balance of your display. Do this by lining up the three color blocks containing solid Apple logos. You must adjust each slider so that the color of the Apple fades into the background. It can be quite tricky. If you're having trouble finding the sweet spot, you should move back from your display and squint your eyes.

The final items are much easier to deal with: the standard gamma value for Mac displays is 1.8; the setting that best fits your display should be obvious, and more often than not, you'll prefer that no white point correction is required.

share your tips!

Got some tips you'd like to share with your fellow MacHome readers? Please send them to:

chris @ machome.com

All mail is assumed intended for publication, and we reserve the right to edit tips for brevity and clarity. When sending your tips, please make sure to include your full name.

FreeCOM SCSI CD-R(W)

(Re)WRITE YOUR CDs WITH 4X ULTRASPEED

- Make your own CDs on CD-R media in less than nine minutes (Satellite 8X/20X)!!
- CD-ReWritable, use your CD-RW like an optical disk and rewrite your CD-RW media as many times as you like!
- Ideal for CD creation, backup, archiving and exchanging data
- Makes faultless copies of CD-ROM, CD-I and Audio CD
- Everything you need to get up running MAC & PC ready including: Toast, Easy CD Creator, CD marker pen, 1X CD-R, 1X CD-RW media)

Fastest CD-RW drive with 2 MB Buffer



CD-R(W)

CD-R 8X/20X	\$599
CD-RW 8X/2X/20X	\$599
CD-RW 4X/4X/20X	\$449

FreeCOM USB CD-R(W)

USB Slimline CD-RW

WRITE CDs WITH THE CD-RW TRAVELLER

- Worlds first and smallest mobile CD-RW drive
- Write and Read CDs on the road
- Connects to iMac/G3 USB port
- 4X/4X/20X CD-RW drive built-in
- Built-in rechargeable battery pack
- Also works on PC Notebooks/Desktop with optional Parallel Cable or PCMCIA Cable (pc only)
- Comes completely with Toast, 1 CD-R, 1 CD-RW media, CD marker pen and USB Cable



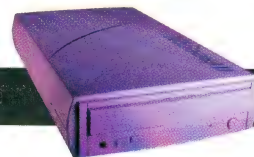
CD-RW

CD-RW TRAVELLER USB \$599

USB CD-RW

(Re)write your CDs with the USB CD-RW

- Create your own CDs on CD-R media
- ReWrite your CD-RWs and replace your floppy-, Zip-, Jaz-, Mo- and SyQuest disks at once!
- Ideal for CD creation, backup, archiving and exchanging data
- 2X Write, rewrite 2X and read 20X drive built-in
- Connects to iMac/G3 USB port
- Also works on PC Notebooks/Desktop with optional Parallel Cable or PCMCIA Cable (pc only)
- Comes completely with Toast, 1 CD-R media, 1X CD-RW media, CD marker pen and USB Cable



CD-RW

2X/2X/6X EXTERN USB

\$299

FOR DEALER INFO: COMPUTER CONNECTIONS/FRECOM
PHONE: 800-438 53 36 FAX: 781 - 271 0873

WWW.STORAGECOMPANY.COM

MACWAREHOUSE CYBERIAN Outpost MAC Zone

1-800-255-6227

www.outpost.com

1-800-248-0800

PC to iMac, Future Shocked Files, and Mac vs. (Virtual) PC Software

Q You previously answered a question about reading PC files on an iMac [April 1999]. My situation is similar, but your advice doesn't fit. When I send files from my PC at work to my iMac at home, I get an unreadable attachment. Nothing will open it. When I save it to the desktop, QuickTime tries to open it but produces pages of gibberish.

Harvey S. Irlen

A The problems you are experiencing may be due to different compression technologies used by your iMac and your PC. While your iMac uses Aladdin Systems' StuffIt to compress files before they are sent via e-mail, your PC likely uses a Zip variant. You can install StuffIt Expander for Windows on your PC, and you can get a shareware program such as MacZip for your Macintosh. However, that can be a bit of a pain. The easiest way to get around this problem is to e-mail the files without using compression. Every e-mail application should have such an option. Refer to the application's manual for more information.

The other possibility is that the file simply cannot be read by any Macintosh application. While many file formats are cross-platform, some remain exclusively Mac or PC. MacLink Plus may offer a solution to your problem, since it trans-

lates many nonstandard file formats into a form the Macintosh can understand.

Q One day late last month I downloaded some files from the Internet around midnight. Later that same day I went back to those files and noticed that the "Date Modified" read "Tomorrow at 12:30AM." I would have expected to see "Today" or even "Yesterday," but not "Tomorrow"! My computer's date and time are correct. What could have happened?

Fraser Keith

A You have no reason to worry; there is no problem with your Macintosh. It's likely that the file server's clock was simply ahead of your Mac's clock. When the files finally arrived, they carried the next day's date. The Mac OS saw that the file's last modified date was actually in the future, and using the informal naming convention, simply

referred to the file as being modified "Tomorrow."

You can replicate the strange occurrence quite easily. Go to the Finder and use the "View" menu to view one of your folders "as List." Launch the

Date & Time control panel and move the date forward by one day. Return to the folder on the Finder and select "New Folder" from the "File" menu. Name it whatever you like. Return to the Date & Time control panel and correct the date. Now, when you return to the Finder,

you'll see that the folder you just created carries a "Date Modified" of "Tomorrow." It's an interesting but harmless quirk.

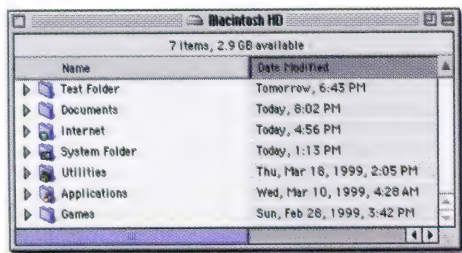
Q I am a new iMac owner, and I am very happy with my machine, with one important exception. Sometimes I'll be browsing the Internet and the screen goes black, just as if someone pulled the power plug. It will not restart, no matter what I do. I walk away from it for 30 to 40 minutes and then hit the start button — and it comes alive and everything works perfectly. Can you tell me what is causing this very frustrating problem?

Chris Perner

A The behavior you describe suggests your iMac may be experiencing a hardware failure. It appears that an internal component may actually be overheating — perhaps the power supply or the analog video board. As soon as it reaches a certain temperature, the computer fails. It must then take time to cool off before it can be successfully restarted. You'll need to take your iMac to an authorized service provider to have it comprehensively diagnosed and repaired.

Q I have a PowerBook G3 with a passive-matrix screen that has suited my needs until now. My sister is replacing her Macintosh LC II and giving me the monitor. Can I connect the monitor to my PowerBook so I don't get seasick playing *Tomb Raider II*?

Damian



A It should be a simple task for you to hook your sister's display to your computer. Included with your PowerBook was a display cable adapter — a small, stubby black connector that plugs into the display port at the back of the machine. Simply connect your sister's display to the connector and reboot your machine.

There's only one catch: Due to its age, the display will only support one resolution, and it's likely to be lower than the native resolution of your PowerBook (800 x 600). The LC II was sold with either a 12-inch (512 x 384) display or a 13-inch (640 x 480) display. Our tests here show that *Tomb Raider II* runs without incident on either display. Due to the lack of screen real estate, however,



you'll certainly feel cramped using the display for normal tasks, such as browsing the Internet or word processing.

Q As part of Apple's Smart Start promotion program, we received Connectix Virtual PC. We chose that option because there is much more software available for the PC. Should we purchase PC applications and games, or hold out for the Mac version? Is there a way to help persuade developers to make their applications and games cross-platform?

John P. Hoover

A Virtual PC is an acceptable solution for running applications that aren't available on the Mac — so long as those applications are not overly demanding of the processor. It takes a great deal of raw processing power for Virtual PC to emulate a PC environment. Every instruction destined for an Intel Pentium processor must be translated into an instruction the PowerPC processor can understand. As a

result, PC programs running within Virtual PC often operate at a fraction of the speed they would on a real PC. It is always better to run a Macintosh version of an application. Applications designed for the Mac take specific advantage of the Mac OS and the Macintosh hardware — something PC programs running in an emulation environment simply cannot do.

Virtual PC can take advantage of a 3Dfx accelerator card to enhance the performance of PC games. It's a bit of a craphoot, however. Some PC games rely principally on the 3Dfx card for visuals, and those games will run at acceptable speeds. Other PC games require heavy involvement of the central processor, and this can slow things down significantly under emulation.

The impending release of OpenGL for the Macintosh will ease the difficulty of porting PC games to the Macintosh. OpenGL (Open Graphics Library) is a cross-platform programming language for defining 2-D and 3-D graphic images. Games written for OpenGL can be converted to the Macintosh with minimal effort. The Macintosh version of *Quake III: Arena*, for example, contains only 15K of different code than the PC version. This is a phenomenal development for the Macintosh platform — and an economic model that game developers can't ignore. Instead of investing many thousands of dollars and months of work to port a game to the Mac platform, developers can now achieve the same result in under a week. With a little luck, this will lead to an explosion in cross-platform games. **MM**

let us know!

Got a Mac problem that's driving you nuts? Let us take a crack at it. We'll answer questions of general interest to all readers. All mail is assumed intended for publication, and we reserve the right to edit questions for brevity and clarity. When sending your questions, include your full name and phone number. Send your questions to:

questions@machome.com

subscribe today

get 12 issues of

MacHome plus 6 bonus CD-ROMs packed with demos, shareware, utilities, games galore and more!

for only \$29.95

800.800.6542
Have your credit card ready!

MacHome

Compression Technologies

Putting the Squeeze on Digital Files

Compression technologies came about as a way to contract file sizes for transfer over slow modem lines and to fit large files on cramped floppy disks. As computers became more capable, file sizes ballooned, and it became necessary to minimize them to enhance their portability.

Software Compression

Standard software compression uses a set of algorithms to analyze a file for repeating or redundant components. In an application's data fork, there may be numerous repeating characters. Should the compressor come across as "7777777777777777," for example, it would simply note at the location that "7" must be repeated 15 times. The compressor might also look for repeating strings of characters and substitute a smaller notation for those characters. Use this article as an analogy: The word "compression" appears many times. To compress the size of the article, we might simply abbreviate "compression" to "cp."

Most compression technologies include a key within the actual compressed file to describe the abbreviations. Popular abbreviations will be stored in the decompression engine, however, further minimizing the file size.

Image Compression

While software compression must be 100% accurate in order for the files to be functional upon decompression, image file compression can take a few liberties. Image compression works similarly to text and numeric compression in that it searches out and notes repeating blocks of color. Look at the illustration accompanying this article. There are several

areas of white space in the large image file. Instead of repeating the value of "white" for each white pixel, the compressor simply notes the length of the string of white pixels.

The compressor can also insert a smaller value for a frequently repeated color. The value of a color is represented by 24 bits — say, 01101110 0011010101011011. To reduce the size of the file, the compressor may abbreviate repeating colors with just eight or 16 bits.

The biggest variance in software compression occurs with picture-quality settings. To reduce the size of an image file, the compressor may approximate neighboring colors. For example, a single pixel might be a specific value of blue. Its eight neighbors, meanwhile, may be similar in color but carry a different color value. If the color variance falls within an acceptable level, the compressor will note the entire block of pixels as the same color.

Video Compression

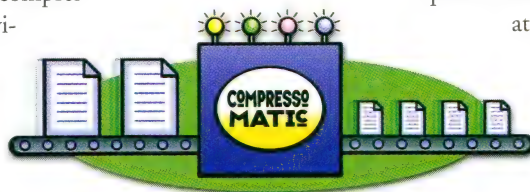
Digital video compression works very similarly to image compression. The biggest difference is that a video com-

pressor looks for graphic similarities from frame to frame. Consider a video segment showing someone being interviewed. The principal motion will come from the person's head and face. The background, meanwhile, usually remains constant. A video compressor will note that elements of the background remain unchanged from frame to frame. The color values of the background will be noted in a periodic "key frame." The key frame determines repeating color values so that the data need not be repeated.

Audio Compression

Because audio compression doesn't require 100% accuracy, one way to compress audio is by removing an entire piece of audio information at regular intervals. When an audio file is decreased from 44KHz to 22KHz, every second block of audio information is removed.

Audio can also be compressed by reducing the number of bits that represent one value of audio. High-quality audio is usually represented by 16 bits of information per block. The compressor can reduce the size of the file by selecting the best eight bits to represent that 16-bit block. Both of these methods result in a discernible decrease in the audio quality, however. New audio compression techniques such as MPEG-3 use compression algorithms to reduce the size of the file through analysis and notation of similar, repeating blocks of audio. ■



MacHome

Education

Play &

Work,

Solutions for

Subscribe to

MacHome each month.

Every issue is packed with the latest hardware and software reviews, product news, iMac updates, features, education articles and entertainment reviews!

You'll also receive during the next year **6 bonus CD-ROMs**, Tips Books, Buyers' Guides and more.

Apple brought you the Mac,
we make it easy to understand.

Call Today!

800-800-6542



Subscribe Today!

www.machome.com

advertiser index

Advertiser	Phone	Technical Support	URL	Pg. #
Activision	310-255-2000	310-255-2050	www.activision.com	IFC-1
Apple	800-795-1000	800-SOAPPLE	www.apple.com	2-3
Bungie	800-295-0060	312-255-9600	www.bungie.com	BC
Computer Connections	781-271-0444	781-275-5742	www.storagecompany.com	63
Connectix	800-950-5880	800-839-3627	www.virtualgamestation.com	IBC
Connectix	800-950-5880	800-839-3627	www.connectix.com	17
Earthlink	800-395-8425	800-395-8425	www.earthlink.com	39
Epson	800-GOEPSON	340-782-2600	www.epson.com	7
ixMicro	800-467-8282	408-369-8288	www.ixmicro.com	31
Mac Mall	800-222-2808	N/A	www.macmall.com	68-69
MacWorld Expo	800-645-EXPO	N/A	www.macworldexpo.com	61
Pele	804-340-0820	804-340-0820	www.pelezona.com	19
Kwong Quest, LLC	888-9BENWIN	N/A	www.benwin.com	23
Real Software	512-292-9988	512-292-9988	www.realsoftware.com	27
SES Training Videos	800-727-3055	954-316-0808	www.masterthamacintosh.com	9
VST	978-635-8200	978-635-8282	www.vsttech.com	9

[sales@machome.com]

New 333MHz iMacs!

Original iMac Now Only ~~\$998!~~



LAST CHANCE!

**Guaranteed
Lowest
Price
Anywhere!**

~~\$898!~~

#44098 Call for even lower price! While supplies last!

FREE!

Up to 128MB RAM or INSTANT CASH BACK!

**plus
56K Modem or Iomega Zip Drive!**

**plus
SAVE an Additional \$100!**



Order#	#44237	#44239	#44241	#44242
MHz	300MHz	350MHz w/DVD	350MHz w/Zip	400MHz
RAM	64MB	64MB	128MB	128MB
Price	\$1,598	\$1,998	\$2,498	\$2,998

Monitor sold separately. \$30 installation fee applies for free memory.
Free 56K modem or Iomega Zip Drive is a mfr. mail-in promotion, valid 4/2/99 - 6/27/99 or while supplies last.

PowerMac G3 + Apple 17" Studio Display = Savings!



Purchase any Power Mac G3 listed above and the Apple 17" Studio Display and receive \$100 back!

- 17" (16" Viewable)
- 1600 x 1200 @ 60MHz
- .25 dot pitch
- Mitsubishi Diamondtron CRT

Apple 17" Studio Display
only \$499⁹⁹

SAVE \$100

Mfr. mail-in promotion valid 4/2/99 - 6/27/99 or while supplies last. CPU and monitor must be on the same invoice.

Blowout! PalmPilot Professional with Mac Converter Kit

only \$159⁹⁹

#88147

While supplies last!



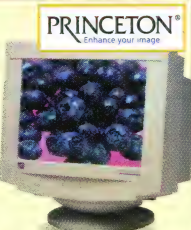
Ultra 72 17" Color Display

- With Mac Adapter 17", 15.8"
- 1280 x 1024

only \$199⁹⁹

#23914

While supplies last!



"SMART" DEAL!

56K V.90 External Modem

Get V.90 right out of the box. No rebates! No hassles!

only \$69⁹⁹

#39443

While supplies last!



Stylus Color 740i Printer

EPSON

The perfect color match to your iMac or Power Mac G3!

- 1440 x 720dpi
- 6ppm black, 5ppm color

only \$249⁹⁹

New!

#45418

Price reflects \$30 mail-in rebate. Call for details. Reg. price is \$279.99.



MICROTEK

Scanmaker X6 USB Color Scanner

- 30-bit, 600 x 1200dpi optical
- 4800dpi enhanced
- USB interface

only \$99⁹⁹

#45434

After \$50 in total mail-in rebates, ends 6/30/99.



CASTLEWOOD

ORB SCSI External 2.2GB Drive

New!

Fast as a hard drive: 10ms seek time, 5400rpm, Ultra SCSI Interface

Unlimited capacity with additional 2.2GB storage

\$199⁹⁹

#44042

Limited quantities available

#44416

2.2GB ORB USB External Drive \$249⁹⁹



QPS

iQue! 4x2x8 CD-Rewritable Drive for the iMac™

- Three drives in one ➤ USB Interface
- Ideal for data archiving
- Translucent Blue Casing
- Excellent addition for MIDI & recording studios

only \$299⁹⁹

#45035



EPSON

Stylus Photo 750 Printer

- 1440 x 720dpi
- 6-color photo quality
- Serial & USB
- Prints up to 8.5" x 44"



New!

only \$299⁹⁹

#44849

**Order Any Time!
Open 24 Hours.**

1-888-579-0698

Order Today by 10 pm EST—Get it Tomorrow by 10:30 am.

New Low Prices!

Order and register to WIN!

Register at: www.macmall.com
Win a 1999 Porsche Boxster

NEW 333MHz iMacs!

Hurry, Last Chance!



**333MHz
only
\$1,198**

Blueberry #44249

Grape #44243

Tangerine #44244

Lime #44247

Strawberry #44245

HOT New COLORS!

We'll Beat Any Price!

Apple Macintosh® PowerBook® G3

233MHz PowerPC G3 32MB RAM/2GB HD/20X CD-ROM

Ethernet/56K Modem/14.1" Active-Matrix Display

was \$2,298
now only **\$1,998** #44230

Call for even lower prices!

#44231	PowerBook G3/266MHz/64MB RAM/4GB Hard Drive/20X CD/Ethernet 56K Modem/1MB Level 2 Cache/14.1" TFT Active-Matrix	was \$2,998	Now only \$2,618
#44232	PowerBook G3/300MHz/64MB RAM/8GB Hard Drive/Ethernet/56K Modem 20X CD-ROM/1MB Level 2 Cache/14.1" TFT Active-Matrix	was \$3,998	Now only \$2,988
#44233	PowerBook G3/300MHz/64MB RAM/8GB Hard Drive/Ethernet/56K Modem DVD-Drive/1MB Level 2 Cache/14.1" TFT Active-Matrix	was \$4,398	Now only \$3,438



up to 300MHz

FREE Extreme Mac 6-Pack

with any purchase! Includes full versions of all 6 titles on one CD!

- ▶ Alley 19 Bowling
- ▶ Bumber Bee-Luxe
- ▶ Checkers Deluxe
- ▶ Diamonds 3D
- ▶ Shadow Wraith
- ▶ Solitaire Antics

Ask for item

#44142

CD shipped in promotional packaging.

\$2.99 S/H fee applies. While supplies last.



Exclusive Instant Cash Back!

- \$100 off** All products priced between \$1,597 & \$2,499
- \$150 off** All products priced between \$2,500 & \$2,999
- \$200 off** All products priced between \$3,000 & \$3,499
- \$250 off** All products priced between \$3,500 & \$4,396
- \$300 off** All products priced \$4,397 & up



No coupons to mail in. No checks to wait for. Just instant savings! Best of all, there is no limit—so order as many times as you want, and keep saving. Sorry, PowerBooks don't qualify for rebates.

Fastest Overnight Delivery

Over 50,000 Products

\$2 Billion in Available Inventory

Custom Configuration

1st Authorized Apple Reseller

Call for details on our latest MacMall Special Promotions! CPU promotions apply to CPU's only in this advertisement and are subject to change due to new product announcements or price drops. All offers expire 6/15/99 unless otherwise noted or while supplies last.

Ares USB Joystick

The most advanced USB joystick available today—whatever kind of game you're playing, the Ares Ultimate Warrior Joystick is ready to take on the challenge.

only **\$19.99** #44872
*With purchase of iMac or G3. Reg. price is \$39.99 & \$38.98.



AppleWorks 5.0

Everything you need to create professional quality documents in one affordable package!

Upgrade for only **\$44.99** #34683

Extensis Suitcase 8

The world's best-selling font manager now supports OS 8.5!

Upgrade for only **\$39.99** #44729

Kai's Photo Soap 2!

- ▶ MacWorld's "Best of Show"
- ▶ Multiple image importing including Photoshop® files
- ▶ Interactive HTML (Web) output
- ▶ Works with Photoshop® compatible plug-ins like KPT 5

as low as **\$29.99** #41538
Price reflects \$15 mfr. mail-in upgrade/competitive upgrade rebate.



Falcon 4.0

The most realistic combat flight simulation available. Battle one-on-one or with up to fifteen players over the Internet!

only **\$47.99** #44747



Introducing the all new Mac Software Buyers Guide!

Call for yours today!
1-888-425-MALL
Or visit us online at:
software.macmall.com



Symantec Super Utility Bundle!

From the makers of the #1 utility comes a four-pack with over \$100 in savings!

only **\$144.99** #43663

*Some items are shipped in promotional packaging.



Tomb Raider Gold Edition

Lara Croft's first adventure...now available for the Mac with 4 all new levels!

\$29.99 #44570



Disney's Winnie the Pooh & Tigger Too Animated StoryBook

Read, Learn and Play with Pooh & Tigger, Too!

\$29.99 #44584



Check out our ALL NEW Web site:
www.macmall.com

Mention your Priority Code: **#ZMHM961**

MacMall

The Mall With It All...For Less!

CTC

Coast to Coast

www.coasttocoastcamera.com

WE ACCEPT ALL
SCHOOL, GOV'T &
CORPORATE BIDS
& POS!! WE SHIP
WORLDWIDE!!

Your Digital Photo Source

24 HOUR FAX
718-265-1754

USA TOLL FREE
800-788-5555

CUSTOMER
SERVICE

800-790-4913

Mon-Thurs 10am-4:30pm
Friday 10am-2pm

192 Avenue U
Brooklyn, NY 11223

SUNDAY 10am-6pm
Mon-Thurs 8:30am-8pm
Friday 8:30am-6:30pm
Saturday Closed

• EXPERT ADVISE
• GREAT LOW PRICES
• COURTEOUS SERVICE
• EXPRESS SHIPPING
AVAILABLE

1-800-788-5555

KODAK



DC-260

\$657

ACCESSORIES

Compact Flash Memory CardsCALL
Parallel Port Card Reader89.95
USB Card Reader99.95
PC Card Adapter24.95
Shockproof Hard Case69.95
AC Adapters49.95
NiMH rechargeable batteries w/charger59.95
NiMH Spare Battery Pack19.95
0.65X Wide Angle Lens for DC-20067.95
0.42X Ultra Wide Macro Lens for DC-40/50/120147.95
1.5X Tele Lens for DC-25/40/50/120/20057.95
2.0X Tele Lens for DC-40/50/12067.95
Macro Lens for DC-40/50/120/20047.95
Digital Camera Cleaning Kit19.95
Micro Fiber Cleaning Cloth9.95

Sony

Mavica FD-91

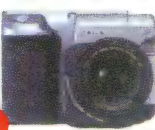
• 1024 x 768

resolution

• 14x Optical

Zoom

\$827



ACCESSORIES

NPF-550 Lithium Battery69.00
Sony Soft Custom Case57.95
Shockproof Hard Case for Sony Digital Cameras69.95
FILTERS & LENSES for FD-51, FD-71, FD-81, FD-91
Hot Mirror Filter69.95
Polarizing Filter29.95
UV Protector19.95
3pc. Filter Kit (UV, ND, FLD)49.95
1.8X Tele127.95
2X Telephoto Extender167.95
3X Telephoto Extender247.95
Wide Angle Lens127.95
Ultra Wide Angle Lens167.95
Macro Lens for Ultra Wide Angle Lens247.95
Wide Angle - Tele Lens Set for DSC-F1CALL
Macro Lens Set197.95
Digital Camera Cleaning Kit29.95
Micro Fiber Cleaning Cloth9.95

Olympus

D-400 Zoom

• 1280 x 960

resolution

• 3x Optical

Zoom

CALL



ACCESSORIES

Parallel Port Card Reader89.95
USB Card Reader99.95
SmartMedia Memory CardsCALL
Floppy Disk Adapter99.95
PC/MCIA Card Adapter87.95
AC Adapter49.00
Rechargeable NiMH Battery w/ Charger59.95
NiMH Spare Battery Pack19.95
Digital Camera Cleaning Kit9.95
Micro Fiber Cleaning Cloth9.95
1.5X Telephoto Extension Lens97.95
2.0X Telephoto Extension Lens167.95
3X-36 Wide Angle Macro Lens197.95
24-50 Wide Angle Lens177.95
Macro 1:1 Lens Set149.95
Hot Mirror FilterCALL
3pc. Filter Kit (UV, ND, FLD)CALL
Custom Fitted Leather Case49.95
Shockproof Hard Case89.95

Nikon

Coolpix 950

• 1600 x 1200

resolution

• 3x Zoom

\$777



ACCESSORIES

Compact Flash Memory CardsCALL
Parallel Port Card Reader89.95
USB Card Reader99.95
PC Card Adapter24.95
Shockproof Hard Case for Nikon Digital Cameras69.95
Soft Case for Nikon Digital Cameras29.95
Nikon AC Adapter49.95
Rechargeable NiMH batteries w/ charger59.95
Nickel metal hydride spare battery pack19.95
UV, ND, FLD Filter Kit59.95
Wide Angle Lens147.95
Wide Angle Filter Lens197.95
Macro Lens Set 1:1 Macro Ratio127.95
1.8X Telephoto Lens127.95
2.0X Telephoto Lens197.95
Digital Camera Cleaning Kit19.95
Micro Fiber Cleaning Cloth9.95

Fuji

MX-2700

• 1800 x 1200

resolution

• 2.5x Zoom

CALL



ACCESSORIES

All SmartMedia Memory CardsCALL
Floppy Disk Adapter99.95
PC/MCIA Card Adapter87.95
Parallel Port Card Reader89.95
USB Card Reader99.95
Micro Fiber Cleaning Cloth9.95
Accessories for DC-330, DS-300, MX-500, MX-700:
Spare Lithium Ion Battery69.95
BC Charger for MX CamerasCALL
Shockproof Hard Case for Fuji Digital Cameras69.95
Soft Case for Fuji Digital Cameras29.95
Hot Mirror FilterCALL
0.65X Wide Angle Lens77.95
1.5X Telephoto Converter77.95
2.0X Telephoto Converter177.95
Macro Lens Set 1:1 Macro Ratio167.95
Wide angle-Telephoto Lens Set137.95

Agfa

ePhoto 1680

• 1343 x 972

resolution

• 3x Zoom

\$577



ACCESSORIES

USB Card Reader99.95
Parallel Port Card Reader89.95
Floppy Disk Adapter99.95
Type I PC/MCIA Adapter87.95
Agfa AC Adapter44.95
Digital Camera Cleaning Kit9.95
Micro Fiber Cleaning Cloth9.95
Rechargeable NiMH Battery w/ Charger59.95
NiMH Spare Battery Pack19.95
FILTERS & LENSES for e1280 & e1680:
Hot Mirror FilterCALL
UV FilterCALL
PolarizingCALL
UV, ND, FLD Filter KitCALL
Shockproof Hard Case for Agfa Digital Cameras69.95
Soft Case for Agfa Digital Cameras29.95
2X Converter (12x zoom)167.95
3X Converter (12x zoom)167.95
0.42X Ultra Wide Angle Lens127.95
0.42X Ultra Wide Angle Macro Lens147.95

Ricoh

RDC-5000

• 1792 x 1200

resolution

• 2.3x Zoom

CALL



ACCESSORIES

USB Card Reader99.95
Parallel Port Card Reader89.95
SmartMedia Memory CardsCALL
Floppy Disk Adapter99.95
PC/MCIA Card Adapter97.95
Rechargeable NiMH w/ charger59.95
NiMH spare battery pack19.95
Ricoh AC Adapter47.95
Shockproof Hard Case49.95
Soft Case29.95
Digital Camera Cleaning Kit19.95
Micro Fiber Cleaning Cloth9.95
Remote Control for All Ricoh Digital Cameras47.95

Digital Cameras

Kodak

DC-200 1152 x 864 res.297
NEW DC-200 Plus317
DC-210 1152 x 864 res. 2X zoom367
DC-210 Plus 1152 x 864 2X zoom387
DC-220 1152 x 864 res. 2X zoom497
DC-260 1536 x 1024 res. 3X zoom667
DC-260 Plus 1536 x 1024 res.CALL
NEW DC-240557
NEW DC-265807

SONY

Mavica FD-91837
Mavica FD-91 Pack927
Mavica FD-81 1024x768, 10X627
Mavica FD-81 Pack707
Mavica FD-71 640x480517
Mavica FD-71 Pack597
Mavica FD-51 640x480 res.387
Mavica FD-51 Pack447
DSC-D700 1344x1024 res. 5X1497
DSC-F55K 1600x1200 res. 2" LCD CALL

OLYMPUS

D-320L 1024x768 res.CALL
D-340R 1280x960, 2X zoom NEW!!CALL
D-400 Zoom 1280 x 960 res.CALL
D-500L 1024x768 res. 3X zoomCALL
D-600L 1280x1024 res. 3X zoomCALL
D-620L 1280x1024 res. 3X zoomCALL
C-2000Z 1600x1200 res. 3X zoomCALL

Nikon

Coolpix 950 1600x1200 res. 3X777
Coolpix 900 1280x960 res. 3X569
Coolpix 700 1600x1200 res. 2.5XCALL

FUJIFILM

MX-500 1280x1024 res. 2X Zoom317
MX-600 1280x1024 res. 3X Zoom467
MX-700 1280x1024 res. 2" LCD427
MX-2700 1600x1200 res. 2.5X Zoom627
DX-10 1024x768 res. 1.8" LCDCALL
DS260HD 1.5 Million PixelsCALL
DS-330 1280x1024 resolution1387
Pictography 3000 Digital Printer CALL
Pictography 4000 Digital Printer CALL

AGFA

ePhoto 1680 1343x972 res. 3X Zoom577
ePhoto 1280 1280x960 res. 3X Zoom297
ePhoto 780 1024x768 res. 1.8" LCD227
NEW CL-30 1400x1080 res. 2X Zoom327
NEW CL-50 1600x1200 res. 3X Zoom557

MINOLTA

Dimage EX Zoom 1500637
Dimage EX Zoom 1500 Wide637
RD-175Blowout!! 3895
RD-3000 New!!CALL

Canon

Powershot A-5 1024x768 res.337
Powershot A-5 Zoom 1024x768 res. 377
Powershot Pro 70 1536x1024 res. CALL

IRICOH

RDC-5000 1792x1200 res. 2.3XCALL
RDC-4300 1280x960 res. 3X Zoom487
RDC-4200 1280x960 res. 3X Zoom397

EPSON

Photo PC700397
Photo PC750 1280x960, 3X Zoom677

SANYO

VPC-X350 1024x768 res. 3X Zoom CALL
VPC-4200 1280x960, 3X Zoom827

Scanners

UMAX



1212P

Astra 610S77
Astra 610P89
Astra 610S/MAC109
Astra 1200S137
Astra 1220S157
Astra 1220P87
Astra 1220USB137
Astra 2400S317
Powerlook II657
Powerlook III1027
Powerlook 3SECALL
Powerlook 2SECALL
CALL FOR NEW REBATES!!

AGFA

Snapscan 1212PCALL
Snapscan 1212USBCALL
Snapscan 1236207
Snapscan EZ237
Snapscan 600377
Arcus IICALL
Duoscan T1200CALL
Duoscan T2500CALL
Duoscan T5000CALL
Duoscan T1200XLCALL

VISIONEER

Paperport 6100BCALL
Paperport OneTouch 5000CALL
Paperport OneTouch 7600 CALL
Paperport Strobe MX for PC CALL
Paperport Strobe V for MAC CALL

CANON

Canoscan 2700547
Canoscan 2710 NEW!!637

NIKON

CoolScan III LS-30797
LS-20001587

MINOLTA

Dimage Scan Dual367
Dimage Scan SpeedCALL
Dimage Scan Multi2177

MICROTEK

Scanmaker V31057
Scanmaker E3 plus87
Scanmaker E3 scsiCALL
Scanmaker X6117
Scanmaker X6el209
Scanmaker 4557
Scanmaker 5CALL
Scanmaker 9600XL1277
Scanmaker 6400847
SlimScan C-389
Scanmaker 35T Plus447

Software

Adobe Photoshop 5.0 Full429
Adobe Photoshop 5.0 Upgr.97
Adobe Illustrator 8.0 Upgr.97
Adobe Illustrator 8.0 Full339
Adobe PageMill 1.0 Upgr.99
Adobe PageMill 3.0 Full95
Adobe PageMaker 6.5 Upgr.97
Adobe FrameMaker 6.5 Upgr.107
Corel Draw 8 Upgr.419
Corel Draw 8 Upgr.209
Kai's Photo Soap 247
Kai's PowerTools 5.0 Upgr.287
Kai's PowerTools 5.0 Upgr.37
Ray Dream Studio Upgr.99
Ray Dream Studio Upgr.269
Metacore Painter 5 Upgr.89
Metacore Painter 5 Upgr. w/ Kai's PowerTools 3DCALL

Printers

Stylus Photo EX



EPSON

Stylus Photo 440117
Stylus Photo 640157
Stylus Photo 740247
Stylus Photo 750 NEW!!CALL
Stylus Photo 850N397
Stylus Photo 900397
Stylus 1520417
Stylus 30001147
Stylus ProXL1497
Powerlite 5000XBCALL

LEXMARK

Colorjet 7200CALL
Colorjet 7200VCALL
Colorjet 5700CALL
Colorjet 5770CALL
Colorjet 3200CALL

We Also Carry the full line of

Optra Series Printers!!!

ALPS

MD-1300357
MD-5000457

Hewlett Packard

Deskjet 340/340CBICALL
Deskjet 420CCALL
Deskjet 697CCALL
Deskjet 712CCALL
Deskjet 882CALL
Deskjet 890CSE/CXICALL
Deskjet 895CSE/CXICALL
Deskjet 1200C/CSE/CXICALL
Deskjet 2000CSECALL
Deskjet 2000CNCALL
Deskjet 1600CCALL

We Also Carry the full line of

LaserJet & ColorJet Models

Fuji

NX-5 PrinterCALL

Polaroid

ColorShot FilmPrinterCALL

CANON

CD-200 Digital PrinterCALL
BJC-250CALL
BJC-500CALL
BJC-80CALL
BJC-7004CALL
BJC-4400CALL
BJC-5000CALL
BJC-8500CALL
MultiPASS C-2500CALL
MultiPASS C-3500CALL
MultiPASS C-5500CALL
MultiPASS L-5000CALL
MultiPASS L-6000CALL

Storage

ZIP



1GB internal219.95
Jaz 1GB external219.95
Jaz 2GB319.95
Zip (scsi/parallel)89.95
Zip (scsi)159
ClikCALL
Sony HFD 200MB Drive179

PDA / Palm Top PC 3Com

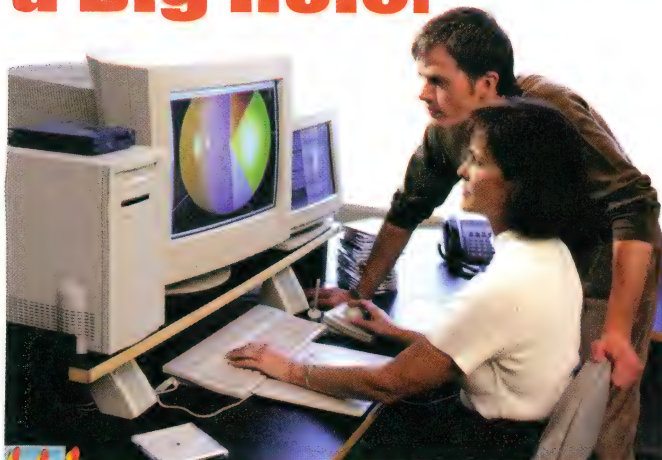
Maxtech PD910387
Maxtech PD920399
HP 360LX 360399
HP 620LX 16MB419
HP 660LX489
Hitachi HPW-200EC689
IBM Workpad729
HP 820LX Jornada729
3Com Palm Pilot Pro159
3Com Palm Pilot III299
3Com Palm Pilot v369
Compaq C-Series 810379
Compaq C-Series 2010c619
Compaq C-Series 2010c629
Sharp MobilonAll Models CALL

\$239



All merchandise is brand new, factory fresh, & carries a 1 year USA or International Warranty. We welcome C.O.D.s, money orders, and certified checks. Please allow 3 to 4 weeks for delivery on personal checks. Our 14 day Satisfaction Guarantee allows for exchanges on products or returns for credit. All returns for credit are subject to a minimum 10% restocking fee. 20% on special order items. All returns must be returned in original condition. Not responsible for typographical errors. Above prices supersede all others and remain in effect until next month's issue. Note that these are mail order prices only - in-store prices and availability may vary. We thank you for shopping with Coast to Coast. Where Service is the Most.

How to Build a Small Business Without Digging a Big Hole:



What do you need to start a small business off on the right foot? It's called EVERYTHING, and you need most of it all at once. Today responsive, reliable computers that you can sit down at and use are essential. The absolute latest bells and whistles are not.

We offer the best of what you actually need in computer hardware – systems, monitors, printers, accessories, even upgrades – all remanufactured to the highest standards, with the most comprehensive warranty in the computer remanufacturing industry.

Everyone knows it takes money to make money. With computers from Pre-Owned Electronics, it just takes a whole lot less.

iMAC/233MHz

(refurbished)

starting
at
\$749!



PowerBook 1400cs

- ▶ PowerPC 603e 117MHz processor
- ▶ 32MB RAM
- ▶ 750MB hard drive
- ▶ CD-ROM drive
- ▶ Color display
- ▶ ClarisWorks software suite

\$995



Refurbished PowerBooks

starting at: **\$299!**

External Jaz Drive

SCSI, with cables, software **\$229!**

A **G3** Ready Power Mac System For Under **\$600?**

You've got it!

The Power Mac 6100/66 computer has everything you need today plus the option to make it a G3 system in the future.

Specifications:

- ▶ PowerPC 601 66MHz processor
- ▶ 24MB RAM
- ▶ Hard drive
- ▶ 4X CD-ROM drive
- ▶ Color monitor
- ▶ Extended keyboard

\$599!



**Call for a catalog:
800-274-5343**

Visit our website at: www.preowned.com

Pre-Owned Electronics

INCORPORATED

125 MIDDLESEX TURNPIKE, BEDFORD, MA 01730

Apple, Macintosh, PowerBook & LaserWriter are registered trademarks of Apple Computer, Inc. Quantities of all product offerings are limited. Advertised prices are valid while supplies last.
© 1999 Pre-Owned Electronics, Inc. All rights reserved. DIS0070

Smart Shopper

Your Direct Source for Mac Products

advertisers' index

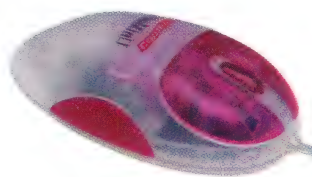


Check These Advertisers for iMac Products

ARS Nova206-889-092775	Desktop Services800-224-589974	MCE800-5000MAC73
Careertapes	Harmonic Vision800-644-499476	Other World
Enterprises603-253-747076	ImagiQ800-750-078774	Computing800-275-4576...78-79
Coast Camera800-788-555570	Keyspan 510-222-013174	Powermax800-621-287177
Coast to Coast800-4-MEMORY75	Leister Productions717-697-137876	PreOwned
Contour Design 800-462-667872	Mace Group 800-644-113275	Electronics800-274-534371
DataTech888-660-868876	MacMall 800-222-2808 ..68-69	World of Reading800-729-370373

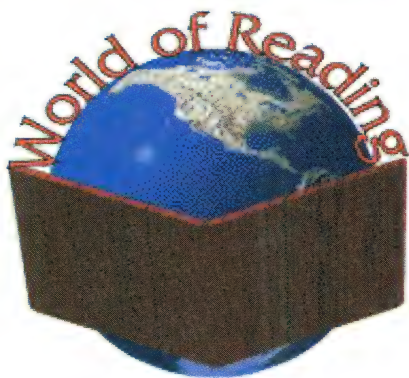
UniTray™

The Perfect
Compliment
to the Uni-
Mouse™



USB

www.contourdesign.com



We offer the widest range of Foreign Language Software for Macs (& PCs) from learning a language (beginning to advanced) as well as multilingual dictionaries and encyclopedias - CD-ROMs for young children to adults - **ALL at discounted prices** (\$20 and up) We also offer foreign language books, tapes, DVDs and videos.

Visit our catalogue online at: <http://www.wor.com>

Or call for our 1998-1999 print catalogue at
(800) 729-3703 or (404) 233-4042

Or fax at (404) 237-5511 Or E-mail at: polyglot@wor.com

WORLD OF READING, LTD. * P.O. Box 13092 * Atlanta, GA 30324-0092

www.PowerBook1.com

Secure Online Ordering!



Your Source for all PowerBook Upgrades and Accessories

newertech

NUpowr 1400/G3 250MHz - \$ 979
NUpowr 1400/G3 216MHz - \$ 689
NUpowr 2400/G3 240MHz - \$ 829
VIEWpowr 1400 (16-bit video) - \$ 239
Bookendz Dock for 34/24/1400 - \$ 179

MCE powrUP 1400/G3 Bundle:
Includes: NUpowr 1400/G3 250MHz/1MB cache
& IBM 4.0 GB 2.5" IDE HD \$ 1329



Kritter Cam \$249
CapSure Card \$129
640x480, 30fps
Video for 3400/2400/G3

MadsonLine AC adapter
for PB 3400, G3, 2400 & 1400
only \$85

half the size/weight of Apple's adapter!

Viking Components
56K v.30 PCMCIA FaxModem
\$99

ASJ
World's Smallest External
56K v.30 FaxModem, no
power supply needed
\$119

Introducing The "Flip Disk"

High capacity, portable
storage for your
PowerBook...
Just plug it in
& it works!



Flip Disk
Flip 20 (2GB) \$449
Flip 40 (4GB) \$579
Flip 60 (6GB) \$749

Type II
PC Card

MCE
Xcarét Media Bay Hard Drives
PB 3400, 3500, 5300, 190; Xcarét Pro for PB G3 Series

6GB 4GB 2GB 0GB (empty)
Xcarét/Pro \$559 \$399 \$319 \$149

POWERBOOK PRODUCTS
MCE
PowerBook Drives

For use in PB 3400, 2400, 1400, 5300, 190, 150 & Duo 2300

MobileStor 2100i	2.1 GB	TOSHIBA	\$ 199	3yr
MobileStor 3200h	3.2 GB	HITACHI	\$ 269	3yr
MobileStor 4000i	4.0 GB	IBM	\$ 309	3yr
MobileStor 4300i	4.3 GB	IBM	\$ 319	3yr
MobileStor 5400i	5.4 GB	IBM	\$ 399	3yr
MobileStor 6400i	6.4 GB	IBM	\$ 539	3yr
MobileStor 6400i	6.4 GB	TOSHIBA	\$ 539	3yr
MobileStor 8000i	8.0 GB	IBM	\$ 749	3yr

IX MICRO
Road Rocket
24bit Video Output for PB G3 series
ONLY \$299



MCE PC Card Diskkeeper
Use our PC-card case for your original
IDE drive and save your megabytes
ONLY \$129

VST PRODUCTS

PowerBook Drives

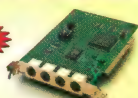
All MCE PowerBook hard drives
include the **MCE PB Hard Drive**
Installation Kit which includes an
installation manual, hex tool,
mounting bracket*, driver software*
and anti-static wrist strap.
*not needed

	Zip Drive	Super Disk	Charger	Battery	Auto Adapter
PB 1400	\$219		\$99	\$119	\$79
PB 5300/190	\$239		\$149		
PB 3400	\$239		\$149	\$149	\$79
NEW G3 Series	\$249	\$219	\$159	\$199	\$79

Ports for Your PowerMac!

SX Pro Serial Card

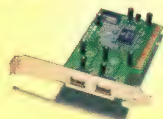
NEW



For the Blue G3 or any PCI Mac

- Provides simultaneous, trouble free use of multiple serial devices
- For Comm Toolbox savvy software
- Just \$179

Keyspan USB Card



Add USB to your PowerMac

- PCI card with 2 USB ports
- Use all the new USB devices on your existing Mac
- UPCI-2 just \$49!

Expand your iMac or G3!

Keyspan USB Serial Adapter

Add 2 Mac serial ports to your iMac or "blue" G3

- For use with tablets, PDAs, cameras & many printers
- Get two ports for the price of single port solutions!
- USA-28 just \$79



Keyspan USB PDA Adapter

Connects Palm Organizers to Your iMac or "Blue" G3

- USA-19 just \$39

NEW

Keyspan USB Hub

Connect more USB devices

- USB compliant 4 port Hub
- UHUB-4X just \$59



30 day money back guarantee and a 5 year warranty



KEYSPAN

www.keyspan.com (510) 222-0131



(800) 213-6356
source code: KWM8

Great Stuff

iMacs4U.com

Just for your iMac

The place to find all of today's hottest products for your new iMac. We specialize in iMacs. It's what we do.

iMac™
in 5 Fruit Flavors
Call for
Best Deal!



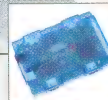
USB
SuperDisk Drive

\$139.95



Macally
USB iHub

\$49.95



Keyspan USB Serial
Adapter

\$79.95



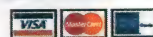
Why buy from the other mail order places? Can their telephone sales representatives really help you, or are they just trying to make a quick sale?

Our specialists can answer your questions, and help you make the right product selection to fit your needs. Call or check out our website today!

www.iMacs4u.com

SECURE ONLINE ORDERING!

800.224.5899



Think Value

MEMORY • STORAGE • PRINTERS • ACCESSORIES

Apple T-Shirts and Hats



\$19.95



\$14.95



www.machome.com



800.577.4MAC



ImagiQ

Mac Only, Mac Everything



Authorized Reseller
and Service Provider

Mac Repairs

Apple Authorized - 2 day turnaround

When you need real answers and essential Mac-specific information - we're the source!

210-377-3545

www.ImagiQ.com

800-750-0787

2325 NW Military Suite 103

San Antonio, TX 78231

Tuesday-Saturday 10AM-6PM

**Advertiser in the
Smart Shopper
call**

David Hughes

415.957.1911

ext. 38

NEW!

Songworks II *polyphonic*

Music Composition & Exploration!



Write any kind of music, from leadsheets to symphonies • MIDI not required • Let Songworks suggest tune and chord ideas! • Can notate what you play, via either MIDI or the letter keys • *Active Listening™* is ideal for learning a part in a chorus (tap one of the parts and hear the others play along!) • *Take a Picture* makes it easy to make music examples • Something to do with all that power in your PowerMac • Imports/Exports MIDI files, too • Sophisticated notation with simple tools. \$125.

also from Ars Nova:

PRACTICA MUSICA "The best music education program for the Mac" (MacUser). With textbook. Solo edition \$99

KIDMUSIC Helps kids learn to read real music notation! Includes Minikeys overlay, 75 songs and exercises. \$75

www.ars-nova.com 800-445-4866

1•800•4 MEMORY
SELL • BUY • TRADE

WE CAN **BEAT**
ANY QUOTED PRICE
ON ANY MEMORY
FROM ANYWHERE

LIFETIME WARRANTY
NO RESTOCKING FEE
WE ARE THE BEST!!!

CALL AROUND
THEN CALL US
NOW BUYING
MEMORY

DIGITAL CAMERAS
NOTEBOOKS

WEB SITE WWW.18004MEMORY.COM

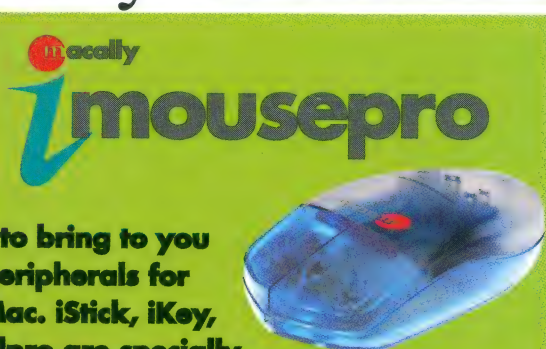
MEMORY

SMART SHOPPER

Perfect Match for your iMac!



macally
iStick



macally
iMousepro

**Macally is proud to bring to you
the latest USB peripherals for
Apple's newest iMac. iStick, iKey,
iMousepro and iBallpro are specially
designed to pair with your new iMac.
They are guaranteed to improve
your productivity.**

macally
iKey



macally
iBallpro



Call us for dealers near you 1-800-644-1132 www.macally.com

All trademarks or registered trademarks are property of their respective owners

Reconditioned MACS & peripherals from DATA TECH

APPLE 1705
17" DISPLAY

\$199

CENTRIS/QUADRAS

Centris 650 8/230	\$149
Quadra 605 8/160	\$129
Quadra 610 8/230	\$129
Quadra 650 8/230	\$199
Quadra 660av 16/230/CD	\$199
Quadra 700 8/230	\$99
Quadra 800 8/230	\$199
Quadra 950 8/230	\$199

POWERMACS

6100/66 8/350	\$249
7100/66 16/230	\$249
7100/80 24/500	\$299
7200/120 16/1G/CD	\$449
7500/100 24/1G/CD	\$549
7600/120 24/1G/CD	\$649
8500/120 32/2G/CD	\$749
8500/150 32/2G/CD	\$799
8500/180 32/2G/CD	\$849
9500/132 32/2G/CD	\$849

MONITORS

13" Apple RGB Display	\$99
14" Apple Trinitron	\$149
14" Apple MultiScan	\$169
15" Apple MultiScan	\$189
17" Apple MultiScan	\$249
17" Apple 1705 Display	\$199
17" Apple 1710 Display	\$299

6-Month Warranty

VISA & MasterCard Accepted

1-800-281-3661

DataTech
REMARKETING, INC.

Fax-On-Demand: 615-860-0109 (24-hrs)

Web Site: www.datatech-rmkt.com

Tel: 615-860-4422

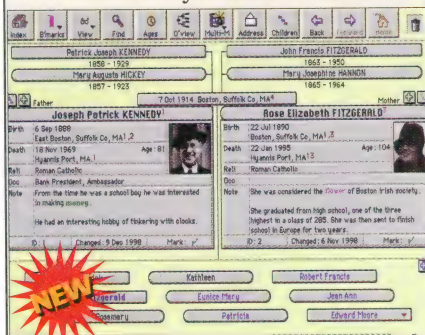
Fax: 615-860-0390

471 Myatt Drive, Madison, TN 37115

Corporate names and trademarks are the property of their respective owners.

REUNION[®] 6

the family tree software



"SPECTACULAR" MacWorld 1/98
Create beautiful wall charts, **GREAT** for family reunions! Organize and store your complete family history, then share it on the Internet. It's easy, fast and fun!

- Link photos, sound, & video
- Effortless Web publishing, including privacy filter
- Drag-and-drop editing
- Over 60 new features in version 6

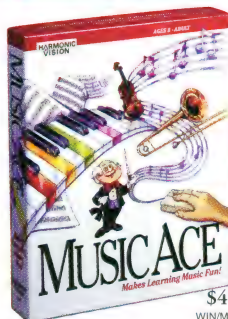
To order, call MacConnection 800-334-4444.
Full working demo at www.LeisterPro.com.
For a free brochure contact...

Leister Productions

PO Box 289, Mechanicsburg, PA 17055
phone 717-697-1378 • fax 717-697-4373
Email: info@LeisterPro.com

MUSIC ACE™

Makes Learning Music Fun!



"My kids love it, but they usually have to drag it away from me first."

—Miami Herald

\$49.95
WIN/MAC CD.

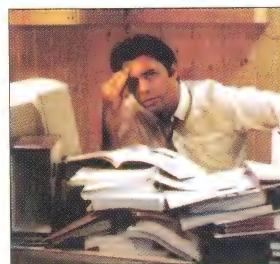
- Exceptional value: lessons, games and composition
- Winner of 28 awards and honors
- Ideal for beginners of all ages
- Colorful graphics and animation
- Highly recommended by music educators
- No MIDI keyboard required

Download demo with 3 FREE lessons and games at
www.harmonicvision.com

1-800-644-4994

HARMONIC VISION™

Software that Brings Music to Life!™



THROW OUT THE MANUALS!

Now you can learn your
Macintosh the **easy** way by renting
videos through the mail.

Videos are a thousand times better than the manual because you can see how to do things. We have over 100 different Mac titles including Mac Operating System, ClarisWorks, HyperCard, and Quicken. A two week rental is just \$9 per tape plus S&H. Returning rentals is easy! Just stick the tape in the mail; return postage is already affixed. We also sell and rent CD-ROMs.

Get a Free Sales & Rentals Catalog:
CareerTAPES® Enterprises
(603) 253-7470

P.O. Box 309, Center Harbor, NH 03226
www.onlinemagazine.com/careertapes/

9 Big Ones



Not just 9 games, but 9
BLOCKBUSTER games, each one voted
"Best Game of the Year" in its own category. These games sold individually for a combined price of over \$300!
Get them now for only... **\$39.95**



800-577-4MAC

CALL THE MAC EXPERTS!

Your one-stop source for everything Macintosh®. Friendly help and expert advice is our specialty!
Call for the absolute lowest prices and immediate delivery on over 30,000 Mac® products!

The PowerMax Difference:

- Our salespeople are some of the most knowledgeable in the business. They're not order takers and they don't push for a one time sale. Well over half our business comes from repeat and referred customers!
- We have 800 line technical support with no voice mail. Always a live human being!
- We answer the phone: "how can we help you?" not "may I take your order?"
- We live in Oregon, where there is no sales tax and the people are friendly and polite!
- Government and corporate purchase orders normally approved the same day.
- We have competitive prices on over 30,000 Macintosh® items.
- All we do is Macintosh®—our company is run entirely on Macs®.
- We offer you choices: buy over the phone, over the internet, or in person, all with the same great prices and super service!*
- We listen.

The other guys

- They sell you a box.
- If you have a problem, they tell you to call the manufacturer. And then you get to wait on hold for a long, long time.

PowerMax Hard Drives

PowerMax Hard Drives contain only top-quality cables, power supplies and internal mechanisms. Satisfaction guaranteed or your money back!*



2 GB EXTERNAL 7200 RPM BARRACUDA!
\$229

9.1 GB ULTRA WIDE 7200 RPM BARRACUDA
\$439

Call for the latest in SCSI card controllers for "Blue" Macs, external hard drives starting at \$169, CDR Recorders, DVD-ROM and DVD-RAM both internal and external, plus so much more!!

PowerMax Trinitrons®

- # PM15-501 25 mm dot pitch—best at 1024 x 768 @ 85Hz... **\$229**
- # PM17-700 25 mm dot pitch—best at 1024 x 768 @ 85Hz... **\$329**
- # PM17TE+ 25 mm dot pitch—best at 1152 x 870 @ 75Hz... **\$499**
- # PM20T 30 mm dot pitch—best at 1152 x 870 @ 75Hz... **\$688**
- # PM20T+ 25 mm dot pitch—best at 1152 x 870 @ 75Hz... **\$749**
- # PM1000T 21" Trinitron! 25 mm dot pitch up to at 1600x1280 @ 80Hz... **\$1188**
- # PM4000T 24" Trinitron! 25 mm dot pitch up to at 1920x1200 @ 95Hz... **\$1999**

PowerMax Trinitron® monitors are designed specifically for the rigorous demands of the Macintosh®. They ship complete with Mac®-ready cables and adapters, a five year warranty, and our satisfaction guarantee: if the monitor is not just right, we'll replace it for you!

POWER MAX
Knowledge is Power

**GUARANTEED
BEST DEALS ON
MAC SOFTWARE!**



internal CD, an extended keyboard, and 17" Apple display! All this for only **\$688!!**

Looking for a six-PCI slot Mac? Call PowerMax!

**Our least expensive
PowerPC system ever!**

Package includes pre-tested 6100 with 40 Mb of RAM, 500 Mb hard drive, 9500's starting as low as \$888!

Are you a Macintosh Users Group member? Call us to find out how to get exclusive special discounts and deals!

LACIE
LIMITED

- | | |
|---------------------------------|------------------------------------|
| 2 GB External Drive.....\$239 | Zip Gig-O-Color 10 Pak.....\$88 |
| 9 GB Wide w/2940 PCI...\$849 | Zip Plus 100 Mb.....\$149 |
| 18 Gb Wide w/2940.....\$1249 | USB Zip 100MB.....\$145 |
| DVD RAM External.....\$749 | Zip 100MB SCSI Drive.....\$119 |
| 4x12x CDR External.....\$329 | Jaz 2Gb SCSI Drive.....\$329 |
| 2x2x6x CDRW External...\$349 | New! Zip 250Mb Drive.....\$188 |
| Electron 19T Display.....\$679 | Jaz 1 Gb Cartridge.....\$83 |
| AIT External w/Respect...\$1988 | Jaz 2 Gb Cartridge.....\$88 |
| AIT Autoloader.....\$4288 | Imagewriter Carrying Case.....\$24 |



**Perfect
Trinitrons®
from 15"
to 24"!**

SPECIAL PURCHASE!
Newton MessagePad 120, only **\$149!** Still beats the Palm Pilot hands down!

EPSON

Guaranteed best prices on the complete line of Epson printers!



Authorized Reseller

If you don't see an authorized reseller logo— you better ask lots of good questions!

EDITORS CHOICE AWARD SPECIALS!

We've taken the best of the best Mac world has to offer and are offering them at the lowest prices ever! All are all award-winning products unsurpassed in their category!

- | | |
|--|---|
| Utility: Conflict Catcher.....\$69 | Display: Mits. Diamond Pro 900u...\$729 |
| Internet: M/S Internet Explorer....Free! | Science: StatView 5.0.....\$499 |
| Cross-Platform: Dave 2.1.....\$109 | Image-Editing: Photoshop 5.0 U...\$174 |
| Game: Unreal.....\$30 | Drawing: Illustrator 8.0 U.....\$119 |
| Printer: Epson Stylus 740.....\$239 | Digital Camera: Olympus D-600L...\$729 |
| Education: Kid Pix Studio Deluxe...\$29 | Input Device: Wacom Intuos 6x8...\$299 |
| Reference: Britannica 99.....\$55 | Web Authoring: GoLive Cyberst...\$299 |
| Software of the year: Office 98....\$199 | Web Graphics: Macromedia Flash \$279 |

Best selection of pre-owned Macs ever!

- Fully bench-tested Macs® at the best possible pricing.
- Sensational warranties - buy with confidence!
- Wide selection of G3 upgradable models- our Mac® experts will go over every detail with you!
- With used and refurbished Macs® you get: better expansion, better price/performance, upgradability and most are fully G3 upgradable!
- Huge selection with new models available every day!

This month's inventory list: and new arrivals daily!
See our web site for complete descriptions and pictures!

- | | |
|---|---|
| 6115/60 8/350/CD.....\$199 | 7500/100 32/1 Gb/CD.....\$588 |
| 6110/60 24/1 2/CD.....\$279 | PowerBook 5300C 16/750.....\$588 |
| 6200/75 12/1 Gb/CD.....\$288 | 6400/200 32/2.4 Gb/CD.....\$599 |
| 6100/66 8/500/CD.....\$299 | 7600/120 16/1 Gb/CD.....\$649 |
| 6100/60 16/250/CD.....\$299 | StarMax 4200 32/2.5 Gb/CD Twr...\$649 |
| 7100/80 24/1 Gb/CD.....\$319 | PwrTwr Pro 225 32/2/Jaz.....\$849 |
| 6230/75 16/1 Gb/CD.....\$329 | 8500/180 16/6Gb/CD.....\$849 |
| 7200/75 24/500/CD.....\$349 | 9500/233 32/2 Gb/CD.....\$1199 |
| 7200/90 8500/CD.....\$388 | Ref iMac G3/233 32/4/24x.....\$Call! |
| PowerCurve 120 20/800/CD.....\$388 | Ref 6500/225 32/3 Gb/CD.....\$749 |
| PowerBook 180C 14/160/Mod.....\$399 | Ref 7300/180 16/2 Gb/12x.....\$799 |
| 8100/80 16/250/CD.....\$429 | Ref PowerBook 5300C 16/750.....\$829 |
| StarMax 3000/180 16/1 2/CD.....\$449 | Ref 6500/250 32/4/24x.....\$849 |
| Power 100 40/365.....\$449 | Ref 6500/250 32/4/12x/Zip.....\$899 |
| 5200/75 24/750/CD all-in-one.....\$449 | PowerBook 3400C/180 16/1.3.....\$1199 |
| Umax J700 24/2 Gb/CD.....\$449 | Ref G3 266 Tower 32/6/Zip/24x...\$1499 |
| 8100/100 16/500/CD.....\$488 | Ref G3 300 Tower 64/8/Zip/24x...\$1749 |
| PowerCenter 150 32/2 Gb/CD.....\$488 | ...No else has this kind of selection at these kinds of prices! |
| 5260/100 16/1 2/CD all-in-one.....\$588 | |

Just a sample of our 30,000 items!

Call today for the best deals on modems, scanners, software, hard drives, removable drives and media, USB products, accessories and more!

- | | |
|--|-------------------------------------|
| Printers | Modems |
| Epson 800N- Was \$499, Now...\$349 | Dayna 56K/10BT PCMCIA card...\$149 |
| Epson Photo EX.....\$379 | Practical Peripherals 28.8.....\$39 |
| Used LaserWriter® 12/640.....\$788 | Internal 56K.....\$99 |
| Ref HP 4ML Laser Printer.....\$369 | Storage |
| GCC Elite 1208 Superize.....\$3088 | SuperDisk LS-120 5 Pack.....\$49 |
| Networking Devices | PowerMax 12X Ext. CD-ROM.....\$99 |
| Dayna AAUI to Thin Transceiver...\$29 | JackHammer PCI SCSI Card.....\$129 |
| SVEC 5 Port 10/100 Dual Hub...\$129 | CDR Recordable Media.....\$1.25 |
| Displays | Upgrades |
| Voxon 14" Color Display.....\$99 | Sonnet 300MHz w/1 Mb Cache...\$589 |
| Used Apple 15" Display.....\$99 | NoPuwr G3 240 for 1400.....\$719 |
| Used Apple 17" Multiscan.....\$239 | Input Devices |
| Ref Apple 17" ColorSync.....\$349 | Wacom Intuos 6x8 Tablet.....\$309 |
| Keyboards | Wacom Intuos 12x12 Tablet.....\$419 |
| Alps ADB with built-in trackpad...\$39 | We're your complete USB source! |
| Macally USB Keyboard.....\$39 | USB External Floppy Drive.....\$99 |
| Extended ADB Keyboard.....\$35 | USB Programmable Joystick.....\$39 |
| | PCI to USB Adapter.....\$29 |

**OR ORDER ON LINE AT
WWW.POWERMAX.COM!**
Free freight on orders placed
online- over 30,000 Mac items!

We accept educational and corporate purchase orders, and are experts in financing for virtually any size business!



800-621-2871

Local: (503) 624-1827 • Fax (503) 624-1635
email: sales@powermax.com

Prices subject to change without notice. Prices reflect cash discount. Credit card orders strictly verified against fraudulent use. With use of credit card as payment customer acknowledges that some products are subject to final sale. Many prices are limited to stock on hand. All brand or product names are registered trademarks of their respective holders.
*Some restrictions apply.

Open Monday-Friday: 9am-8pm & Saturday: 10am-5pm CST E-Mail Us at: owc@macsales.com

Other World Computing

Serving the Mac Universe Since 1988

Competitive Prices, Quality Products and NEVER a Surcharge for Credit Cards!



800-275-4576

School/University/Government/Corporate Purchase Orders Gladly Accepted (subject to credit approval)



**FAST!
EASY!
SECURE!**



Make Your PowerMac a G3 Mac!

It's a Snap to Upgrade your older PowerMac to G3 Power in an instant with the right accelerator card from Other World Computing.

GO G3
Get Your Mac Up To Speed.

**NUBUS
PCI**

SONNET
SIMPLY FAST

XLR8
PINTEREX

Vimage
CORPORATION

POWERLOGIX

SONNET 250 Mhz Sonnet PCI G3 Upgrade
\$279
 • 512k 2:1 Backside Cache
 • For PCI PMacs Listed Below
PCI
GO G3 Get Your Mac Up To Speed.

G3 Power for Under \$300!

SAVE @OWC



24hr. OnLine Ordering & Product Info
Daily Updated Prices & Specials

Find Other World Computing on the Web at:
www.macsales.com

Get the details on Accelerating your Mac at:
www.fastermacs.com

Home About E-Mail OWC Tools Specials Join Our List 800-275-4576

G3 ZIF UPGRADES from \$299!

20th Anniversary G3 UPGRADE only \$379

Official Mac OS 9.2 Accelerating

OWC Serving the Mac Universe since 1988

Friday, March 05, 1999

Search Products View Your Basket

ACCELERATE YOUR MAC AND SHATTER THE SPEED BARRIER!

Select your CPU:

20th Anniversary Mac

or view products by manufacturer:
Sonnet Technologies

or view all acceleration options offered by OWC:

All OWC Processor Cards have a 30 day money back guarantee.

Our hours are:
8:30am-6pm Monday - Friday (Central)
10am-6pm on Saturday (Central)
Phone: 800-275-4576
International: 915-338-8885
FAX: 915-338-4332

All Online Transactions are secured Via Verisign's SSL Encryption System

A Proud Member of the Web Assurance Bureau

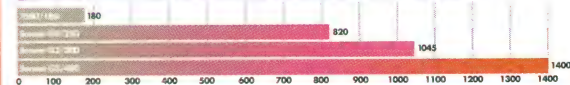
Sonnet PCI G3 Upgrades

For the PowerMac 7300/7500/7600/8500/8515/8600/9500/9515/9600; Workgroup Server 7350, 8550, 9650; Power Comp, PowerWave, UMAX 1700 & 5900; and DayStar Genesis 538.

G3/300mhz w/512k Backside Cache	\$379
MacWEEK ★★★★★	
G3/300mhz w/1024k 2:1 Backside Cache	\$569
G3/333mhz w/1024k 2:1 Backside Cache	\$675
G3/400mhz w/1024k 2:1 Backside Cache	\$939

SAVE @OWC

SONNET PCI G3 UPGRADES MACBENCH SCORES



Sonnet Crescendo Nubus G3 Upgrades

For the PowerMac 6100/7100/8100 & 8115; Performa 6110/6120/6150/6160/6170/6178; Workgroup Server 6100/5010/5015/5020/5025/5030/5035/5040/5045/5050/5055/5060/5065/5070/5075/5080/5085/5090/5095/5100/5105/5110/5115/5120/5125/5130/5135/5140/5145/5150/5155/5160/5165/5170/5175/5180/5185/5190/5195/5200/5205/5210/5215/5220/5225/5230/5235/5240/5245/5250/5255/5260/5265/5270/5275/5280/5285/5290/5295/5300/5305/5310/5315/5320/5325/5330/5335/5340/5345/5350/5355/5360/5365/5370/5375/5380/5385/5390/5395/5400/5405/5410/5415/5420/5425/5430/5435/5440/5445/5450/5455/5460/5465/5470/5475/5480/5485/5490/5495/5500/5505/5510/5515/5520/5525/5530/5535/5540/5545/5550/5555/5560/5565/5570/5575/5580/5585/5590/5595/5600/5605/5610/5615/5620/5625/5630/5635/5640/5645/5650/5655/5660/5665/5670/5675/5680/5685/5690/5695/5700/5705/5710/5715/5720/5725/5730/5735/5740/5745/5750/5755/5760/5765/5770/5775/5780/5785/5790/5795/5800/5805/5810/5815/5820/5825/5830/5835/5840/5845/5850/5855/5860/5865/5870/5875/5880/5885/5890/5895/5900/5905/5910/5915/5920/5925/5930/5935/5940/5945/5950/5955/5960/5965/5970/5975/5980/5985/5990/5995/6000/6005/6010/6015/6020/6025/6030/6035/6040/6045/6050/6055/6060/6065/6070/6075/6080/6085/6090/6095/6100/6105/6110/6115/6120/6125/6130/6135/6140/6145/6150/6155/6160/6165/6170/6175/6180/6185/6190/6195/6200/6205/6210/6215/6220/6225/6230/6235/6240/6245/6250/6255/6260/6265/6270/6275/6280/6285/6290/6295/6300/6305/6310/6315/6320/6325/6330/6335/6340/6345/6350/6355/6360/6365/6370/6375/6380/6385/6390/6395/6400/6405/6410/6415/6420/6425/6430/6435/6440/6445/6450/6455/6460/6465/6470/6475/6480/6485/6490/6495/6500/6505/6510/6515/6520/6525/6530/6535/6540/6545/6550/6555/6560/6565/6570/6575/6580/6585/6590/6595/6600/6605/6610/6615/6620/6625/6630/6635/6640/6645/6650/6655/6660/6665/6670/6675/6680/6685/6690/6695/6700/6705/6710/6715/6720/6725/6730/6735/6740/6745/6750/6755/6760/6765/6770/6775/6780/6785/6790/6795/6800/6805/6810/6815/6820/6825/6830/6835/6840/6845/6850/6855/6860/6865/6870/6875/6880/6885/6890/6895/6900/6905/6910/6915/6920/6925/6930/6935/6940/6945/6950/6955/6960/6965/6970/6975/6980/6985/6990/6995/7000/7005/7010/7015/7020/7025/7030/7035/7040/7045/7050/7055/7060/7065/7070/7075/7080/7085/7090/7095/7100/7105/7110/7115/7120/7125/7130/7135/7140/7145/7150/7155/7160/7165/7170/7175/7180/7185/7190/7195/7200/7205/7210/7215/7220/7225/7230/7235/7240/7245/7250/7255/7260/7265/7270/7275/7280/7285/7290/7295/7300/7305/7310/7315/7320/7325/7330/7335/7340/7345/7350/7355/7360/7365/7370/7375/7380/7385/7390/7395/7400/7405/7410/7415/7420/7425/7430/7435/7440/7445/7450/7455/7460/7465/7470/7475/7480/7485/7490/7495/7500/7505/7510/7515/7520/7525/7530/7535/7540/7545/7550/7555/7560/7565/7570/7575/7580/7585/7590/7595/7600/7605/7610/7615/7620/7625/7630/7635/7640/7645/7650/7655/7660/7665/7670/7675/7680/7685/7690/7695/7700/7705/7710/7715/7720/7725/7730/7735/7740/7745/7750/7755/7760/7765/7770/7775/7780/7785/7790/7795/7800/7805/7810/7815/7820/7825/7830/7835/7840/7845/7850/7855/7860/7865/7870/7875/7880/7885/7890/7895/7900/7905/7910/7915/7920/7925/7930/7935/7940/7945/7950/7955/7960/7965/7970/7975/7980/7985/7990/7995/8000/8005/8010/8015/8020/8025/8030/8035/8040/8045/8050/8055/8060/8065/8070/8075/8080/8085/8090/8095/8100/8105/8110/8115/8120/8125/8130/8135/8140/8145/8150/8155/8160/8165/8170/8175/8180/8185/8190/8195/8200/8205/8210/8215/8220/8225/8230/8235/8240/8245/8250/8255/8260/8265/8270/8275/8280/8285/8290/8295/8300/8305/8310/8315/8320/8325/8330/8335/8340/8345/8350/8355/8360/8365/8370/8375/8380/8385/8390/8395/8400/8405/8410/8415/8420/8425/8430/8435/8440/8445/8450/8455/8460/8465/8470/8475/8480/8485/8490/8495/8500/8505/8510/8515/8520/8525/8530/8535/8540/8545/8550/8555/8560/8565/8570/8575/8580/8585/8590/8595/8600/8605/8610/8615/8620/8625/8630/8635/8640/8645/8650/8655/8660/8665/8670/8675/8680/8685/8690/8695/8700/8705/8710/8715/8720/8725/8730/8735/8740/8745/8750/8755/8760/8765/8770/8775/8780/8785/8790/8795/8800/8805/8810/8815/8820/8825/8830/8835/8840/8845/8850/8855/8860/8865/8870/8875/8880/8885/8890/8895/8900/8905/8910/8915/8920/8925/8930/8935/8940/8945/8950/8955/8960/8965/8970/8975/8980/8985/8990/8995/9000/9005/9010/9015/9020/9025/9030/9035/9040/9045/9050/9055/9060/9065/9070/9075/9080/9085/9090/9095/9100/9105/9110/9115/9120/9125/9130/9135/9140/9145/9150/9155/9160/9165/9170/9175/9180/9185/9190/9195/9200/9205/9210/9215/9220/9225/9230/9235/9240/9245/9250/9255/9260/9265/9270/9275/9280/9285/9290/9295/9300/9305/9310/9315/9320/9325/9330/9335/9340/9345/9350/9355/9360/9365/9370/9375/9380/9385/9390/9395/9400/9405/9410/9415/9420/9425/9430/9435/9440/9445/9450/9455/9460/9465/9470/9475/9480/9485/9490/9495/9500/9505/9510/9515/9520/9525/9530/9535/9540/9545/9550/9555/9560/9565/9570/9575/9580/9585/9590/9595/9600/9605/9610/9615/9620/9625/9630/9635/9640/9645/9650/9655/9660/9665/9670/9675/9680/9685/9690/9695/9700/9705/9710/9715/9720/9725/9730/9735/9740/9745/9750/9755/9760/9765/9770/9775/9780/9785/9790/9795/9800/9805/9810/9815/9820/9825/9830/9835/9840/9845/9850/9855/9860/9865/9870/9875/9880/9885/9890/9895/9900/9905/9910/9915/9920/9925/9930/9935/9940/9945/9950/9955/9960/9965/9970/9975/9980/9985/9990/9995/10000/10005/10010/10015/10020/10025/10030/10035/10040/10045/10050/10055/10060/10065/10070/10075/10080/10085/10090/10095/10100/10105/10110/10115/10120/10125/10130/10135/10140/10145/10150/10155/10160/10165/10170/10175/10180/10185/10190/10195/10200/10205/10210/10215/10220/10225/10230/10235/10240/10245/10250/10255/10260/10265/10270/10275/10280/10285/10290/10295/10300/10305/10310/10315/10320/10325/10330/10335/10340/10345/10350/10355/10360/10365/10370/10375/10380/10385/10390/10395/10400/10405/10410/10415/10420/10425/10430/10435/10440/10445/10450/10455/10460/10465/10470/10475/10480/10485/10490/10495/10500/10505/10510/10515/10520/10525/10530/10535/10540/10545/10550/10555/10560/10565/10570/10575/10580/10585/10590/10595/10600/10605/10610/10615/10620/10625/10630/10635/10640/10645/10650/10655/10660/10665/10670/10675/10680/10685/10690/10695/10700/10705/10710/10715/10720/10725/10730/10735/10740/10745/10750/10755/10760/10765/10770/10775/10780/10785/10790/10795/10800/10805/10810/10815/10820/10825/10830/10835/10840/10845/10850/10855/10860/10865/10870/10875/10880/10885/10890/10895/10900/10905/10910/10915/10920/10925/10930/10935/10940/10945/10950/10955/10960/10965/10970/10975/10980/10985/10990/10995/11000/11005/11010/11015/11020/11025/11030/11035/11040/11045/11050/11055/11060/11065/11070/11075/11080/11085/11090/11095/11100/11105/11110/11115/11120/11125/11130/11135/11140/11145/11150/11155/11160/11165/11170/11175/11180/11185/11190/11195/11200/11205/11210/11215/11220/11225/11230/11235/11240/11245/11250/11255/11260/11265/11270/11275/11280/11285/11290/11295/11300/11305/11310/11315/11320/11325/11330/11335/11340/11345/11350/11355/11360/11365/11370/11375/11380/11385/11390/11395/11400/11405/11410/11415/11420/11425/11430/11435/11440/11445/11450/11455/11460/11465/11470/11475/11480/11485/11490/11495/11500/11505/11510/11515/11520/11525/11530/11535/11540/11545/11550/11555/11560/11565/11570/11575/11580/11585/11590/11595/11600/11605/11610/11615/11620/11625/11630/11635/11640/11645/11650/11655/11660/11665/11670/11675/11680/11685/11690/11695/11700/11705/11710/11715/11720/11725/11730/11735/11740/11745/11750/11755/11760/11765/11770/11775/11780/11785/11790/11795/11800/11805/11810/11815/11820/11825/11830/11835/11840/11845/11850/11855/11860/11865/11870/11875/11880/11885/11890/11895/11900/11905/11910/11915/11920/11925/11930/11935/11940/11945/11950/11955/11960/11965/11970/11975/11980/11985/11990/11995/12000/12005/12010/12015/12020/12025/12030/12035/12040/12045/12050/12055/12060/12065/12070/12075/12080/12085/12090/12095/12100/12105/12110/12115/12120/12125/12130/12135/12140/12145/12150/12155/12160/12165/12170/12175/12180/12185/12190/12195/12200/12205/12210/12215/12220/12225/12230/12235/12240/12245/12250/12255/12260/12265/12270/12275/12280/12285/12290/12295/12300/12305/12310/12315/12320/12325/12330/12335/12340/12345/12350/12355/12360/12365/12370/12375/12380/12385/12390/12395/12400/12405/12410/12415/12420/12425/12430/12435/12440/12445/12450/12455/12460/12465/12470/12475/12480/12485/12490/12495/12500/12505/12510/12515/12520/12525/12530/12535/12540/12545/12550/12555/12560/12565/12570/12575/12580/12585/12590/12595/12600/12605/12610/12615/12620/12625/12630/12635/12640/12645/12650/12655/12660/12665/12670/12675/12680/12685/12690/12695/12700/12705/12710/12715/12720/12725/12730/12735/12740/12745/12750/12755/12760/12765/12770/12775/12780/12785/12790/12795/12800/12805/12810/12815/12820/12825/12830/12835/12840/12845/12850/12855/12860/12865/12870/12875/12880/12885/12890/12895/12900/12905/12910/12915/12920/12925/12930/12935/12940/12945/12950/12955/12960/12965/12970/12975/12980/12985/12990/12995/13000/13005/13010/13015/13020/13025/13030/13035/13040/13045/13050/13055/13060/13065/13070/13075/13080/13085/13090/13095/13100/13105/13110/13115/13120/13125/13130/13135/13140/13145/13150/13155/13160/13165/13170/13175/13180/13185/13190/13195/13200/13205/13210/13215/13220/13225/13230/13235/13240/13245/13250/13255/13260/13265/13270/13275/13280/13285/13290/13295/13300/13305/13310/13315/13320/13325/13330/13335/13340/13345/13350/13355/13360/13365/13370/13375/13380/13385/13390/13395/13400/13405/13410/13415/13420/13425/13430/13435/13440/13445/13450/13455/13460/13465/13470/13475/13480/13485/13490/13495/13500/13505/13510/13515/13520/13525/13530/13535/13540/13545/13550/13555/13560/13565/13570/13575/13580/13585/13590/13595/13600/13605/13610/13615/13620/13625/13630/13635/13640/13645/13650/13655/13660/13665/13670/13675/13680/13685/13690/13695/13700/13705/13710/13715/13720/13725/13730/13735/13740/13745/13750/13755/13760/13765/13770/13775/13780/13785/13790/13795/13800/13805/13810/13815/13820/13825/13830/13835/13840/13845/13850/13855/13860/13865/13870/13875/13880/13885/13890/13895/13900/13905/13910/13915/13920/13925/13930/13935/13940/13945/13950/13955/1396

Other World Computing

Serving the Mac Universe Since 1988

Competitive Prices, Quality Products and NEVER a Surcharge for Credit Cards!



800-275-4576

School/University/Government/Corporate Purchase Orders Gladly Accepted (subject to credit approval)



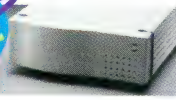
**FAST!
EASY!
SECURE!**

Other World Computing
Has Easy, Fast,
Secure Internet
Ordering Now.

On Web Commerce



SAVE @OWC



SCSI hard drives

Apple ROM 1.2 Gig
Quantum Fireball

\$109

• SCSI
• 9.5ms
• 1 Year Warranty

Internal
External: **\$159**

HardDrives Include

30mb of free software INSTALLED. External version features platinum case with dual SCSI ports, Push-button SCSI ID AND 40 watt power.

QWB HD Tool Kit v2.5.x Included with all Hard Drives
30 Day Money Back Guarantee Full Manufacturer Warranty

Int. Ext.

QUANTUM

9.1gb Viking II	QM309100PXSX 7.5ms 512k 7200rpm	\$399	\$459
9.1gb Atlas III	QM309100TDS 7.8ms 1024k cache 5yr	\$439	\$489
18.2gb Atlas III	QM318200TDS 7.8ms 7200rpm 1024k 5yr	\$759	\$819

SEAGATE

2.15gb Barracuda	ST32550N 8ms 7200rpm 512k Cache 3yr	\$169	\$219
4.5gb Medalist Pro	ST34520N 9.5ms 7200rpm 512k Cache 3yr	\$235	\$289
9.1gb Medalist Pro	ST39140N 9.5ms 7200rpm 512k 3yr	\$309	\$369
9.1gb Barracuda	ST39173N 9.5P 7.1ms 7200rpm 1024k 3yr	\$439	\$499
18.2gb Barracuda	ST118273N 9.5P 7.1ms 7200rpm 1024k 5yr	\$759	\$819

Call or Visit www.owc.com for other IBM, Seagate, & Quantum UltraStar and UltraWide SCSI Drives



SAVE @OWC

IDE hard drives

8.4 Gig IDE IBM
Deskstar

\$175

• 5400 RPM
• 9.5ms
• 3 Year Warranty

Int.

IBM Deskstar GP 8.4gb	5400rpm 9.5ms IDE 3yr Warranty	\$175
IBM Deskstar GP 13.5gb	5400rpm 9.5ms IDE 3yr Warranty	\$275
IBM Deskstar GP 16.8gb	5400rpm 9.5ms IDE 3yr Warranty	\$345
IBM Deskstar GP 20.2gb	5400rpm 9.5ms IDE 3yr Warranty	\$450

Seagate Medalist 6.5gb	5400rpm 11ms 3 Year Warranty	\$165
Seagate Medalist 10.2gb	5400rpm 11ms 3 Year Warranty	\$225

Quantum 3.5" IDE Hard Drives		
Quantum Fireball EX 6.4gb	5400rpm 9.5ms IDE 3.5" w/3yr	\$165
Quantum Fireball EX 13.0gb	5400rpm 9.5ms IDE 3.5" w/3yr	\$255



Removable Storage

Iomega Zip 100MB Drive	SCSI (No Cartridge)	\$99	\$115
Iomega Zip 250MB Drive	SCSI (With 1 Cartridge)	N/A	\$195
Iomega Jaz 2GB Drive	SCSI (No Cartridge)	\$304	\$314
Iomega 100MB Zip Cartridges	11 ea. 10 for \$85	\$85	\$85
Iomega 250MB Zip Cartridges	18 ea. 4 for \$69	\$69	\$69
Panasonic 4x8 CDR Drive	with Toast & Media	\$319	
Yamaha CDRW4260 Drive	2X CD ReWritable/4X Recordable/6X Read w/1 cdc; 1 cdc; Toast 3.5	\$449	
Verbatim 74 Minute Gold CDR Media w/ jewel case	225 ea. 50 for \$99 100 for \$185		

GO MOBILE IN A BIG WAY

with a bigger PowerBook
Hard Drive from OWC



IDE PowerBook Drives

for PowerBook 150, 190/1400/3300/3400 Series: All G3 PowerBooks: Duo 2300 and 2400		
2.1GB Toshiba	4200rpm 17mm Non-Slim with 3 Year Warranty	\$159
4.1GB IBM Travelstor	4200rpm 12mm Slim with 3 Year Warranty	\$209
6.4GB IBM Travelstor	4200rpm 17mm Non-Slim with 3 Year Warranty	\$219
8.1GB IBM Travelstor	4200rpm 17mm Non-Slim with 3 Year Warranty	\$399
Call for our full line of IBM Toshiba and Hitachi		

Call for our full line of IBM, Toshiba and Hitachi

Other World Computing

Mac Memory Headquarters

Whatever Your Mac, We've Got Your Memory.

Mac Memory Products

Memory listed by OWC is New with Lifetime Warranty and 30 Day Money Back Guarantee. All Memory products meet or exceed Apple Specifications.

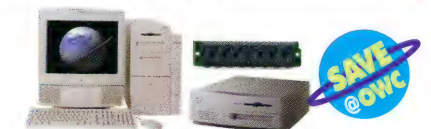
30 PIN SIMMS

4 MEGABYTE	70 or 60 NanoSeconds	\$15
16 MEGABYTE	70 or 60 NanoSeconds	\$35

SPECIAL!

72 PIN SIMMS

8 MEGABYTE	2k Refresh 60ns	\$25
16 MEGABYTE		\$42
32 MEGABYTE		\$79



168 PIN DIMMS

	5V	EDO 5V	EDO 3.3V
16 MEGABYTE	\$42	\$35	\$49
32 MEGABYTE	\$79	\$85	\$89
64 MEGABYTE	\$169	\$139	\$179
128 MEGABYTE	\$279	\$279	N/A

Level 2 Cache Upgrades

	256k	512k	1Mb
6100 PowerMacs/Performas	\$15		
7100/8100 PowerMacs/Performas	\$15		\$99
73/75/76/85/8600 & Compatible Clones	\$69	\$119	
6360/6400/6500; Starmax; & PowerBase	\$89	\$169	

Memory for the New G3 PowerMacs

SDRAM

	66mhz (original)	100mhz (for New G3's)
32 MEG	\$59	\$61
64 MEG	\$99	\$99
128 MEG	\$189	\$199
256 MEG	\$419	\$849

WallStreet & iMac G3 Computers Memory

32 MEGABYTE	\$59
64 MEGABYTE	\$109
128 MEGABYTE	\$209

Call for PowerBook 190/500/1400/3300/4300/5300 and Duo Series Memory

Mac Video RAM

256k PMac 7100/Quadra800/650	\$12
512k PMac 8100/Quadra's/LC's	\$15
1MEG PMac 72/73/75/76/85/8600 & Compat.	\$19
4 MEG Motorola StarMax/PowerMac 4400	\$19
4 MEG G3 Video SGRAM	SPECIAL! \$25

OWC is a Techworks Authorized Reseller.
Call or Visit www.macsales.com for the best prices on Techworks Brand Memory.



Find Other World Computing on the Web at:

www.macsales.com

Get the details on Accelerating your Mac at:

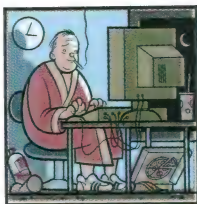
www.fastermacs.com

Other World Computing

224 West Judd St., Woodstock, IL 60098
International: (815) 338-8685
Fax: (815) 338-4332



MH599



the Finder [Commentary]

By John Poultney

What About My Needs?

Products That Don't Work On the Mac But Really, They Should

It's come to my attention that some companies are *still* developing stuff that doesn't work on the Mac. Shocking, yes, but we needn't sit idly by and let it happen.

Wintel-centric companies may capitulate to the Mac community if enough people just ask nicely. It's happened before; it'll happen again.

Think I'm kidding? Diamond Multimedia, makers of the Diamond RIO portable MP3 player, changed its Windows-only tune after running a Web poll gauging Mac interest. "The response from the Mac community was very strong," said marketing director Lorraine Comstock, "So we now have plans to support the Mac with this product."

OK, Let's hear some *chatter* out there!

Starfish Software's REX Pro

Think the Palm "connected organizer" is small and handy? Then you gotta see REX Pro, the diminutive PDA thingie from Starfish Software, Franklin, and Citizen. It holds your appointments, contacts, and what-have-you in a credit-card sized unit that acts as a PC card (née PCMCIA) to swap data with PCs without any extra hardware. How cool is that? Too cool for the Mac, apparently.

"Starfish does not develop software for the Mac," public relations specialist Kate Dueck said. "We support Windows 32-bit operating systems." Yet some backsliding was evident: "We have had conversations with Apple and hope that we can work together in the near future."

Let's hope for the best. Read up on REX at www.the-gadgeteer.com/rexpro-review.html. Write Starfish at

1700 Green Hills Road, Scotts Valley, CA 95066. E-mail the company at cs@starfish.com.

Mattel/Intel Play X3 Microscope

It's unrealistic to expect Intel to develop anything for the Mac, but what the heck. The \$99 Play X3 Microscope, made by an Intel/Mattel joint venture, is a digital camera that magnifies objects up to 300 times — power to examine raisins, PowerPC chips, dead bugs, etc. But even the strongest magnification won't reveal Mattel's reasoning not to develop Mac software. All a PR rep would tell me was, "No, they will not be developing Mac versions of these products, and none of the executives are available for comment at this time." Such terseness I hardly expected from a company I supported with many Hot Wheels purchases.

Write to Mattel at 333 Continental Blvd., El Segundo, CA 90245. A customer feedback page is at www.service.mattel.com/contact.asp.

TV Hosts' Program Master

The Program Master lets you select a TV program to record and then beam the

info to your VCR via a small hardware device. Touchless VCR programming! But the software's for Windows only, and they won't tell me why. Politely request consideration for the Mac — Write TV Host (www.tvhost.com) at 3935 Jonestown Rd., Harrisburg, PA 17109, or e-mail etvhelp@tvhost.com.

NewCom's e-Cam


We can always use more video options for the Mac, especially ones with a *clever* twist such as NewCom's e-Cam, which records and sends video as e-mail with one click. Spokesman Brian Iannessa said, "There are no plans to make a Mac version of the e-Cam now. There may be a USB version, though this is still not definite."

Learn more about the e-Cam at <http://newcominc.com>. Like it?

Then ask NewCom for

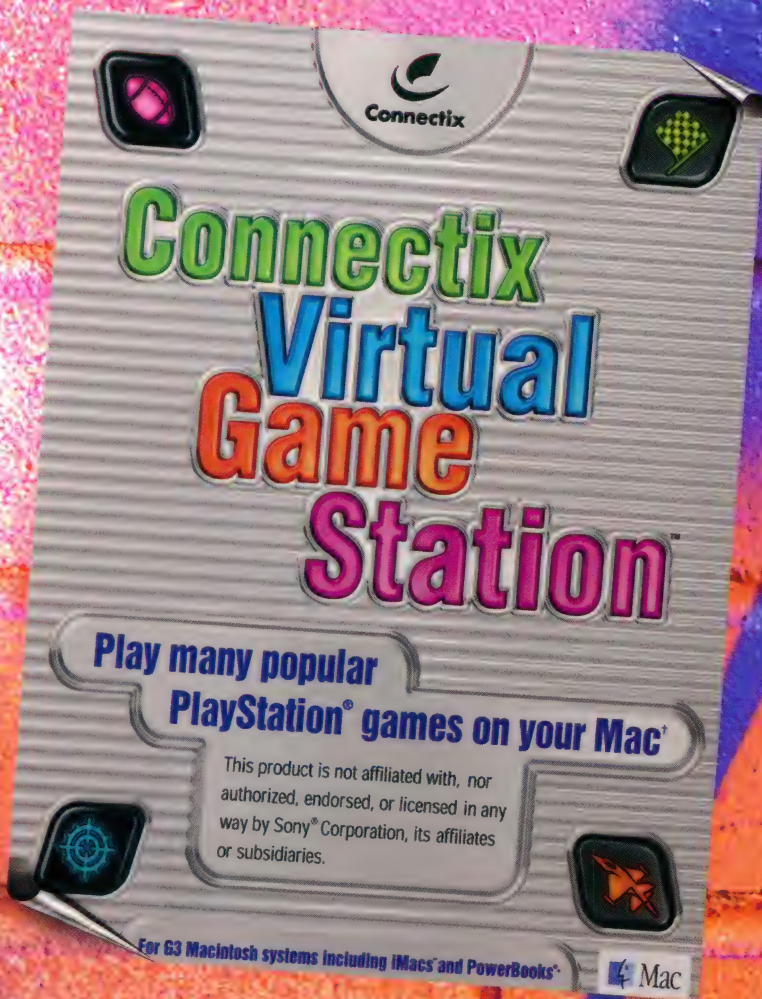
a Mac version. Write to 31166 Via Colinas, Westlake Village, CA 91362-4500; e-mail the company at marketing@newcominc.com.

UPS' Online Office

Do any shipping with UPS? Then get ready to get mad if you don't have a PC. UPS's Online Office shipping system is going PC-only as of October 1, though UPS claims Mac users can do the same things over the Internet. Express yourself (www.ups.com) at 55 Glenlake Parkway NE, Atlanta, GA 30328, or e-mail them at customer.service@ups.com. 

Got Game?

Play many popular
PlayStation®
games on your
Mac



Buy it now!

at your favorite computer stores or at www.connectix.com
For more info call: 1800 950 5880

This product is not affiliated with, nor authorized, endorsed or licensed in any way by Sony Corporation, its affiliates or subsidiaries.

© Copyright 1999 Connectix Corporation. Connectix is a registered trademark of Connectix Corporation, and Connectix Virtual Game Station is a trademark of Connectix Corporation. PlayStation is a registered trademark of Sony Computer Entertainment Corporation.

 **Connectix**

IN
STORES
NOW

MYTH II

SOULBLIGHTER™



"A to-die-for sequel.
If you missed out
on the first
Myth, don't
repeat the
mistake."

- MacAddict
"Freakin' Awesome"
Rating

"A mighty
successor
to a great
game."

- Computer
Gaming World,
★★★★ 1/2

"Another great
game... easily a
must-buy for the
Myth fan."

- GameCenter,
★★★★

"Bungie has done a
marvelous job of
enhancing what
was already a
stellar game"

- MacWorld
★★★★ 1/2

"Smarter,
better-
designed,
and a true
sequel, in
every sense."

- Next Gen.
Online

"Myth II
is a text-
book example of
how to make a
great game."

- Happy Puppy,
10 Rating

"Myth II is about as good as a computer game can possibly be."

- GameSpot, 9.3 Rating

To get Myth II: Soulblighter head to your nearest reseller, call
1-800-295-0060, or visit us online at www.bungie.com.

BUNGIE

Myth II: Soulblighter is a trademark of Bungie Software Productions Corporation. © 1999 Bungie Software Productions Corporation. All rights reserved.

Think MacHome!

63% OFF Newsstand

Yes

- ☐ I want **12 issues of MacHome** plus 6 bonus CD-ROMs (packed with demos, shareware, utilities, and games galore!) for only \$34.95!
- ☐ **Best deal:** Give me 2 years for only \$54.95! (save 71% off retail)

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

☐ Bill me later ☐ Payment enclosed





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS PERMIT #124 MT. MORRIS, IL 61054

POSTAGE WILL BE PAID BY ADDRESSEE

MacHome

P.O. Box 469

Mt. Morris, IL 61054-7971



Don't Miss This Offer!!

To our valued subscribers, please accept this coupon worth \$7.95 and use it towards your **Apple Think Different** hat.

Return this card to:

MacHome (Hat Purchase)
703 Market Street, Suite 535
San Francisco, CA 94103



Enclose a check for \$10.00 plus \$1.50 shipping and handling for your **Think Different Hat**, a **\$17.95 value!!**

Offer expires June 30, 1999

Hat's Off To You!

Attention Subscribers Important News

Dear *MacHome* Reader:

You will now receive a CD-ROM with **every other issue**. This is to ensure that you keep receiving the high-quality CD-ROM that you have come to expect from *MacHome*. This will also allow us to avoid duplication of content, and help do our part for the environment by cutting down on paper and plastic use and disposal.

By saving on production costs, we are able to pass along these saving to you, our valued customer. It means that we won't have to increase our prices in the near future, and it helps ensure that we remain focused on the high-quality editorial and the integrity you've always received from *MacHome*. However, we will fulfill our commitment to you by extending your subscription by one issue for each two CDs that you will miss. And, we will round the number up – for example, if you were supposed to receive three CDs, we'll extend your subscription by two issues of *MacHome*.

All of us at *MacHome* thank you for your continued support over the years and we look forward to a continued wonderful relationship.

Cordially,
James Capparell, President, *MacHome*

Hat's Off To You Offer on Back 